

jewelry

History & Technique from the Egyptians to the Present

Guido Gregoriotti

Indira Gandhi National
Centre for the Arts

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A jewel has many meanings. It is a work of art, an ornament denoting rank, a statement of dress, a treasure, a sign of power, an investment, an ethnic clue, an ostentation.

One of the most famous and dependable Parisian jewelers, whose base is in Place Vendôme, makes it a professional rule never to reveal the identity of his customers. One exception was made, however, when the firm was put in charge of preparing the ceremonial crown for the Empress of Iran. It would have been difficult to keep it anonymous: 1469 diamonds, 36 rubies, as many emeralds and 105 pearls were mounted on the crown in Teheran, after a year's work. Why jewels are never enough to satisfy is a problem for anthropologists and psychologists to explain. A bouquet of 6,000 diamonds was shown at the Great Exhibition of 1851 in London; perhaps satisfying enough? Between 1884 and 1917 the Tsar of Russia presented members of his family with fifty Easter eggs with surprises in them, created by the famous Fabergé in enamel and precious stones.

If we pause to think of the quantity of jewels worked into gold dug up at Troy, in Mesopotamia, in Egypt and Peru, we see the ancients could compete favorably with modern craftsmen. Also — and a curious thing to have to admit with today's technology — the ancients had techniques which no one since has known how to repeat.

The history of jewelry, too, has a certain amount of unknown meaning. It even sometimes has a superstitious aura of occult magic.

Guido Gregoriotti's narrative of the fabulous history of jewelry places it in context in the history of art, while interweaving many aspects of the evolution of culture.

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The author would like to thank Graham Hughes, art director of Goldsmiths Hall, London, and Fritz Falk, director of the Schmuckmuseum, Pforzheim.

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right The "Sylvia" pendant in gold, enamel, agate, diamonds and rubies by Paul Henri Vever, Paris 1900 (Musée des Arts Décoratifs, Paris). Opposite the title page Sixteenth-century French jewels from a detail of *Woman at her Toilet* by the Fontainebleau school (Worcester Art Museum, Worcester, Massachusetts). title page Emerald surrounded by diamonds from a late eighteenth-century Russian necklace, and a pendant in the shape of a peacock in gold, enamel, diamonds and moonstones by L. Gautrait (c. 1900).



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Jewelry as an ornament and distinction: from shells to gold, symbol of the sun

In ancient times, as soon as man was able to establish communities requiring, if only rudimentarily, the institution of social status or the assignment of important duties, he began to adorn himself with rather ostentatious objects so as to confer prestige and esteem on himself, and these were made from material which was hard to come by, and therefore precious. At the beginning and for long subsequent periods the magical properties of these ornaments were of major importance, but nevertheless many apparently also had a decorative purpose. The oldest evidence of such ornaments, which were made from birds' feathers, felines' and fishes' teeth, pieces of reindeer antler and mammoth tusk, comes from archaeological excavation, and it is believed that these objects date back to the eighth millennium BC. It can be seen in the evolution of some communities that certain material, like tusks, antlers and shells, were cut, carved, pierced and engraved with designs which were carried out with flint or obsidian tools.

Another less ancient piece of evidence is provided by rock paintings where various ornaments are clearly visible on the bodies of the painted figures. Even today in certain isolated tribes in Africa, South America and Oceania, whose evolution is immensely backward, the people decorate themselves with the same materials used by our ancestors so long ago.

After the prehistoric phase, which ended with the arrival of writing, those communities which practiced this new means of communication underwent a much more rapid evolution. Man's interest then extended to secondary minerals, namely those which had broken away from their inaccessible places of formation and had been carried to the earth's crust by underground sources of water. While examining the untouched alluvial deposits, he found glassy stones with bright, colored reflections and pebbles of various shapes and sizes which, when briefly cleaned and rubbed, reflected the sun's splendor. It is therefore easy to understand why gold has always been considered the symbol of the sun.

Ruler's head, Benin bronze, Nigeria (Museum für Völkerkunde, Vienna). Ornaments and jewels were originally marks of distinction, rank or function and were also attributed with magical powers. Nevertheless, their decorative purpose has always been significant.

With the discovery of gold, silver and various other minerals, personal precious ornaments took on the general aesthetic features which remain today. Over the centuries jewelry forms have frequently complied with the figurative arts which inspired them.

Every jewel has its function in relation to a certain part of the body and this severely restricts the goldsmith in his search for new shapes or in the execution of new ideas. The greater or lesser yield of precious mineral deposits at certain times has also affected the beauty of jewelry. In ancient Egypt there was a long period in which silver had a greater monetary value than gold, so more gold was used in jewelry. The abundance or scarcity of some precious or semiprecious stones in certain periods made the polychromy of jewelry rather monotonous for the goldsmiths. A good example is the jewelry of the eighteenth century which, because of an exceptional yield of diamonds from the Brazilian mines,

brought about an almost total employment of this precious stone.

In every case over the centuries where artists have intervened in its design, jewelry has been of very high quality. Suffice it to look at the Hellenistic and Renaissance periods (the latter which has left us a wealth of evidence) to evaluate the qualitative influence that artists had over the goldsmiths' work of that time. However, the fascinating jewelry of the so-called barbaric and medieval periods should not go unnoticed.

For some time modern jewelry has revived the interest of artists, sculptors and designers. This is proving to be beneficial as commercial production has been based on the same designs and traditional shapes for far too long. Books on the subject of jewelry, which are becoming increasingly more popular, are also encouraging the general public as well as collectors to be more discerning.



Female figures in a ritual dance, cave paintings from Tassili (Sabara). right African mask decorated with shells.





Gold: ancient and modern techniques of extraction and manufacture

Gold is a metal which in its natural state offers an unequalled stability and beauty. Moreover its malleability permits the manufacture of almost transparently thin leaves, while from one ounce of gold it is possible to draw a fine wire fifty miles long. The ductility of gold diminishes in relation to the amount of other metals alloyed with it. Its melting point is between 1832° and 1940°F , it is not subject to normal oxidization and is insoluble in nearly all common acids. The density of gold is about 19.3 times the weight of an equal volume of water and about 7 times that of a flint pebble of the same size.

Although present in very short measure in almost all rocks, in the sea and rivers, in sand and even in plants, the areas which are rich in gold are few and scattered throughout the world. The geological origins of gold are not fully understood, but it is believed to come, as other metals do, from the deepest recesses of the earth. The mineral most commonly associated with gold, apart from silver and quartz, is iron pyrites which is often mistaken for gold because of its apparent similarity to it. Natural gold is generally alloyed with silver in varying degrees from at least 10 percent to about 50 percent. When the natural alloy exceeds 20 percent the yellow metal tends to be very pale and greenish in color.

Auriferous deposits, like other minerals, can be divided into primary and secondary types. The primary ones are veins of metal found in volcanic rock and the secondary ones are the alluvial deposits formed by the disintegration of these rocks by the continuous action of running water. A nugget of nearly 160 pounds originated in this way and was discovered at a shallow depth on the Ballarat goldfields in Australia. It was christened "Welcome Stranger."

It was easy to establish, even when the means of weighing used today were as yet unknown, that the weight of gold in relation to its volume was significant and using this information the people of antiquity who discovered gold were able to devise ways of separating the gold from particles of mineral dispersed in sand or in auriferous rocks. They hammered and ground the minerals to powder which they then washed with a current of water over fleece. The heavy particles of gold sank to the bottom and were held by the grease in the wool, while the other mineral debris, being lighter, was carried away by the water. When it was dry the gold was shaken out of the fleece into a receptacle, ready to be melted.

Detail of a sword belt made from gold sheet, Phoenician-Punic, sixth century BC (Museo Arqueológico Nacional, Madrid). The stamped figures stand out from the granulated background.



Egyptian gold-mining map on papyrus (Museo Egizio, Turin).

A more advanced method was used by the ancient Egyptians. Mural paintings of the eighteenth dynasty illustrate a process of washing the pulverized auriferous mineral by means of a sluice made of sloping wooden channels, with obstacles to trap the precious metal. Plates smeared with mercury, which only amalgamates with gold, were placed on the bottom of the channels. These plates were then recovered and the gold was separated from the mercury by distillation.

More efficient modern methods using machinery and chemicals have made it possible to extract still more gold from the debris from old mines and to take a larger percentage of the precious metal from auriferous minerals. The best system was invented by J. S. MacArthur and R. W. and W. Forrest of Glasgow in 1886. It is based on a cyanide process. Very finely ground gold-containing powder is put in a watery solution of cyanide and sodium, which transforms it into potassium aurocyanide. Then by a complicated process, during which zinc and oxygen are used, the gold is precipitated and dried and treated with dilute sulphuric acid to dissolve out the zinc. The gold is then fused into ingots which are sent to a refinery to be finally purified of other metals.

The most ancient extractions of mineral gold were, to the best of our knowledge, in Asia Minor. Other deposits were mined in Nubia and Arabia by the Egyptians. The most ancient documentary evidence of these is a papyrus map of some gold mines dating from the fourteenth century BC which is preserved in the

Museo Egizio in Turin. The ancient Greeks found gold on some of the islands of the Cyclades and in Macedonia and Thrace, and during the Hellenistic period Alexander the Great's conquests probably resulted in great quantities of gold flowing into Greece from Iran, Asia Minor and Egypt. During the period of the Roman empire, Italy, the Iberian province and Gaul assumed some importance as sources of gold. In his *Natural History* Pliny recounts that in Vercellae, in the Piedmont region, the employment of more than five thousand miners in the excavation of gold was prohibited.

During the medieval period in Europe gold resources fell to a very low level and quantities of precious metal were imported to substitute the exhausted mines of the ancient world.

The first important transatlantic gold deposit was discovered in New Granada (Colombia) in 1537; during the seventeenth century it was the largest supplier of gold in the western world which later benefited from the yield of the Brazilian mines.

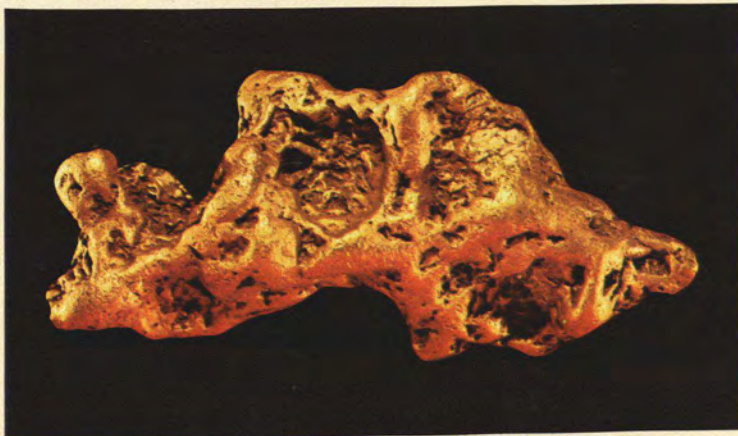
During the first forty years of the nineteenth century production in South America underwent a sharp decline while other ore deposits were discovered in Russia. In 1848 in North America gold nuggets were found by a sawmill builder in a river near San Francisco, which at that time only had four hundred inhabitants. The news of this discovery attracted crowds of prospectors and in a few months the population of California had increased tenfold. At the end of the century new deposits, still productive today, were found in the region of the Yukon River on the Alaskan frontier with Canada.

In 1851 a miner, returned from California, found gold in the state of Victoria, Australia, in an area which he was certain manifested the same geological features. Important gold deposits were discovered in 1884 in the Transvaal in South Africa, and from that time South African mines have produced more gold than those in any other country. In modern times gold has been found in Europe: in Transylvania and Siberia.

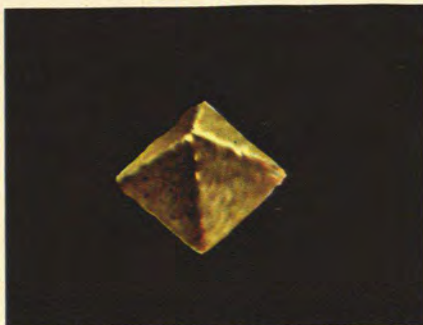
Silver and copper can be mixed with gold in both liquid and solid form, in all proportions, but if the amount of copper exceeds 18 percent the gold becomes fragile and difficult to work. The most common alloys used in modern jewelry are: 25 percent silver (green gold), 30 percent silver (gold leaf), not less than 25 percent made up of palladium and nickel (white gold), 15-20 percent iron (gray gold), 25 percent iron (blue gold). White gold was first used in 1917-18.

The standard of a gold alloy is the percentage of pure gold it contains. The standard alloys most used in modern jewelry are: $916/000 = 22$ carats, $833/000 = 20$ carats, $750/000 = 18$ carats, $625/000 = 15$ carats, $500/000 = 12$ carats, $375/000 = 9$ carats. All alloys diminish the malleability of gold and increase its resistance.

Gold is not susceptible to compression or condensation. Its molecules move and alter position according



above *Auriferous quartz* (detail on the left). below *Gold in the form of an octahedral crystal* (actual size : .08 ins).
left *A nugget of Californian gold.*





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Pendant of gold sheet, Noicattaro, sixth century BC (Museo Archeologico, Bari). This is an example of repoussé work and stamping. above left Detail of a gold necklace of rhomboidal mesh with beads of Silenus, Etruscan, sixth to fifth century BC (Museo Nazionale, Naples). below left Earring in gold sheet with chains and filigree work, Hellenistic, fourth century BC.

to the pressure they receive in such a way that, for example, when beaten, gold increases in surface area while losing thickness. After being fused into lumps it is beaten into sheets of the required thickness and then cut to the approximate dimensions and shape of the desired object.

Sheets of gold can also be reduced to thin leaves which are generally used to gild metal or wooden objects. Gilding bronze, copper or iron jewelry, before the invention of the electrolytic bath, was done by sprinkling the part that was to be gilded with a mixture of gold and mercury. When the object was put by the fire, the mercury would dissolve while the gold would stick firmly to the object. A third method of gilding is immersion, that is to say immersing the article to be gilded in a solution of gold chloride and other compounds at a temperature of 176°F. The pre-Columbians gilded their copper ornaments by sprinkling them with minute grains of gold and copper alloy and heating them until the grains fused upon them.

Relief decoration on sheet gold began with the discovery of the metal itself. After reducing the gold to a thin malleable lamina, a shape can be stamped onto it by hammering the sheet over a model or mold (usually made of wood) in positive or negative relief, or by beating it by hand against a semiresistant material such as wax, lead or pitch. Contours, molding, perforation and hemispheres can all be obtained with the appropriate

tools, and engraving tools can be used to make any kind of design. A pointed tool made of agate can be used to trace the designs or decorations lightly on a thin sheet of gold resting on a background of wax. Relief work has not changed at all over the centuries and is exactly the same for silver, copper and pewter.

To obtain completely round objects such as human or animal heads or amphorae the object was hammered into two hemispherical molds and then soldered together.

The technique of gold wire was also widely used in all sorts of ways at the same time as relief work. Before the invention of the mechanical draw plate, wires were made by cutting the gold lamina into strips which were as wide as they were thick, and rolling them between two smooth, very hard surfaces. Since the earliest times gold wire has been used for framing, subdividing, decorating and supporting the elements of a jewel, and it is essential in the making of brooches, earrings, plaits and chains.

The decorative use of simple or rounded wire is called filigree. The wire, bent by various methods into the desired design, is soldered onto a backing of sheet gold, or is used in openwork patterns without a background. Different kinds of filigree are also used for making chains, strings, plaits and garments.

Chains have always been, and still are, of great importance in jewelry all over the world, and modern technology has not found it easy to surpass the perfection and variety of gold chains, plaits and garments made during the Hellenistic period (third to first century BC). Apart from simple chains consisting of a succession of links of different shapes and thicknesses, one of the most ancient types of chain is the loop-in-loop in which the links are prepared and soldered before the chain is put together. The first link is bent in two equal halves, like a double semicircle, with the two edges lying side by side; these are slightly widened to make a loophole for the second double semicircle to pass through, whereafter the second link is treated as the first to allow the passage of the third link and so on. If another length of chain is to be joined alongside the first one, the double semicircles must be passed through the lateral link as well. Many chain threads can be woven to make a very supple garment.

For reasons of cost it was rarely considered worthwhile to cast from precious metals. If the desired relief from the cast was only to be visible from one side, it was sufficient to fill the cast obtained from a mold with melted metal and then to finish it off with an engraving tool. If, however, the object in question was to be fully modeled the lost wax technique was used. This consists of preparing a wax model of the figure to be cast in gold, with a funnel at the base through which the melted wax escapes when heated and a wire thread at the other end. The model is then encased in a thick layer of clay; when it has dried it is put into a kiln so that the wax can melt and run out. Before the clay cools the melted gold is then poured in through the same funnel and the piece of wire



*Gold collar with repoussé work, Irish, seventh century BC (Victoria and Albert Museum, London).
right Gold helmet with repoussé work and engraving, Ur, c. 2700 BC (Bagdad Museum).*

removed to leave a narrow air vent. The clay mold is then removed with a chisel and the gold object inside should be identical to the "lost" wax model. The intaglio technique, although not frequently used, consists of making designs in relief by cutting the metal from the front with chisels and engraving tools. This method was generally used for relief designs on ring bezels, medallions and pendants.

Granulation, which is one of the ancient goldsmiths' techniques, dates back to the third millennium BC but remains a mystery to this day. Its use virtually died out at the beginning of the Christian era, and only in the second half of the nineteenth century did the Roman goldsmith Augusto Castellani (1829-1914) attempt, albeit unsatisfactorily, to repeat it. In 1933 an Englishman H. P. Littledale obtained good results, but by means that were probably very different from those used by the ancient goldsmiths. The same must be said for the procedure adopted more recently by F. Magi and V. Federici in Rome.

Granulation, which consists of decorating jewelry

with minute granules of gold, was intensely developed between the seventh and sixth centuries BC by the Etruscans, and this technique was almost certainly imported into Italy from the east by the Phoenicians. The granule sizes vary between approximately .04 inches and .25 inches diameter. Spheres of a larger diameter were discarded. Gold dust, where the granules were approximately the same size as grains of sand, was also used.

The first technical mystery concerns the manufacture of the granules. These were probably made either by placing small pieces of gold between layers of powdered charcoal in a crucible and heating this until at melting point the pieces of gold became spherical, or else by pouring the melted gold from the crucible onto a marble slab from a certain height; on impact the same effect is obtained as when pouring mercury, namely the formation of small spheres of various sizes, leaving the unpleasant task of grading them for size.

The second and most mysterious secret regards the soldering of the spheres, either onto a gold sheet or to each other. The soldering is quite invisible on Etruscan

jewelry. The joining of various parts in very ancient jewelry was carried out mechanically, namely with hinges, by two pieces folded together and burnished and with pieces of binding wire. Proper soldering, which belongs to the most highly developed phase of the goldsmith's art, works by inserting between two or more pieces of gold which are to be soldered a sheet of metal with a lower melting point than the metal being soldered.

Littledale patented a technical process called colloid hard soldering based on the fact that when copper is heated in contact with gold, the melting point of the two metals together is noticeably lower. Therefore by smearing copper salt on the points of contact of the spheres a good solder can be obtained at 1634°F which would not affect a piece of all-gold jewelry whose melting point is 1940°F.

The mounting of precious and semiprecious stones and of ceramics for personal ornaments goes back to the third millennium BC and was exploited to the full by the goldsmiths of ancient Egypt. The first method was to solder a thin strip of gold vertically to the sheet of gold which was to accommodate the stone, and this strip went round the edge of the jewel. The upper edges of the strip were then hammered to hold the stone in place. Later, in the medieval era, the agrafe mount became very popular in which the stone was clasped by the hammered edges of a trilobed or polylobed support. The first and second methods lasted in various stages of development until the eighteenth century when mounting, especially of precious stones, was reduced to fine threads of gold crossed behind the jewel, the ends of which clasped the edges of the stone. With pearls and coral, however, holes are made in which studs are cemented.





Precious materials : diamonds, pearls and coral

The explanations given by scholars of the formation of the diamond are varied, but they practically all agree that it is formed deep down in the earth's crust by enormous pressures and high temperatures exerted on carbon by magma gases. The mineral thus formed in the unfathomable rocks is gradually brought to the surface by eruptions and vertical alluvial movements. It tends always to be associated with accumulations of granite sand, whose particularly recognizable characteristics render the geological sites of diamond deposits relatively easily identifiable.

The diamond is pure carbon, one of the principal elements of which organic and inorganic bodies are composed. Plants, animals, and the human body contain carbon. It appears in its pure state only in diamonds and graphite and in a relatively pure state in coal and lignite, which are fossilized vegetable matter. Although they are composed of the same substance, the enormous physical differences between diamond and graphite are due to the arrangement of their atoms: diamond crystals are arranged cubically (isometric) while in graphite they are rhomboids (trigonometric). As a result the diamond is the hardest of all the minerals, number ten on Mohs' scale, while the index of graphite is only one.

Although the diamond is the hardest mineral, it is not the heaviest. It is usually found in octahedral or hexahedral shapes, often with protruding points and slightly convex facets pitted or marked by corrosion. Sometimes two octahedral shapes may be united into twin crystals. Less common are the cube crystals and rhombic dodecahedrons. The ease with which the diamond can be cut relates to the structure of the crystals in the octahedron and, since it has both high refractive and dispersive levels, when skillfully cut, these give it the characteristic fire and its extraordinary brilliance.

In addition to colorless diamonds, which are clear

Diamonds, from Oranjemund, South Africa. Diamonds are pure carbon and when found are usually octahedral or hexahedral with receding corners and slightly convex surfaces.



(white or blue-white), those tinged with yellow, pea green, light blue, blue, pink, red and black can also be used. A variety of diamond called bort and the carbonado (black diamond) are used in industry and also for cutting other diamonds.

India is probably the oldest known source of diamonds; it is believed that the gem was already in use in the third millennium BC but for a long time it was confused with other stones of similar appearance. It was not until the first millennium AD that the diamond's true value was realized. Apart from the Sanskrit poems and Pliny's writings, the presence of diamonds in India was confirmed by Marco Polo, who mentioned the kingdom of Mutfli as being a diamond trading region. Descriptions of actual deposits, however, were only recorded towards the middle of the seventeenth century by the Frenchman Jean Baptiste Tavernier who journeyed as far as Golconda in India, and who wrote a report entitled *Voyages en Turquie, in Perse et aux Indes* from which a wealth of information can be obtained.

The Indian diamond deposits, like those of other precious or semiprecious stones, were mostly of the secondary type, that is to say, of exogenous origin. They were chiefly situated on the eastern side of the Deccan Plain in three definable zones stretching from the river Pennar northwards as far as the Ganges. The mines, which go back to the remotest antiquity, were practically exhausted in the eighteenth century, although they have been mined, and a few very famous crystals found, right up until today.

Famous diamonds such as the Great Mogul, the Koh-i-Noor and the Hope were found in the Kollar mines on the left bank of the river Kistna. Another famous diamond, the Regent or Pitt diamond, was found in the Pantial mines in the same region.

In India, traditional methods were generally used in

diamond mining. It has been calculated that the country has probably produced about ten million carats or 2.5 tons of diamonds.

At the beginning of 1670 important diamond deposits were found in Brazil. Here, in a similar way to the finding of gold in Australia, the discovery was made by someone (apparently a missionary who had previously been in India) who remarked that the geological nature of the land was similar to the diamondiferous zones in India. Another tradition relates that gold prospectors were using rough diamonds as tallies in gambling games until one day a few such stones came into the hands of a Dutch consul from Lisbon, who recognized them for what they were. However, since Tejuco, now Diamantina, the first place where diamonds were found, is near auriferous deposits, it is probable that the real finders were the gold prospectors themselves.

When the news first reached Europe, it was received with incredulity and fear that the value of Indian diamonds would decrease. Rumors were started that the Brazilian stones were softer and of inferior quality, so when Portuguese traders found difficulty in getting a good price for Brazilian gems, they shipped them to Goa and passed them off as Indian.

Soon diamonds were being found over a vast area, from the regions of São Paulo and the Paraná River in the east to the region of Goya and the Mato Grosso in the west and to the north at Bahia. At the beginning there was a great deal of confusion and disorganization. Governments in trying to extract the greatest possible profit from the mines perpetrated a series of frauds and appropriations. Finally in 1891 the territories were restored to their owners.

For the most part, the Brazilian deposits were secondary alluvial deposits and, therefore, found in river beds. Large quantities of diamonds are found in gravels



Didactic imitations of famous diamonds: left to right Orloff, Regent or Pitt, Cullinan.

embedded in a clay cemented conglomerate known as *cascalho*, along with other minerals such as quartz, tourmaline, topaz and zircon. They have also been found in caves or grottoes whose surfaces were covered in *cascalho* which has a variable thickness of between 2 inches and 12 inches. From some of these grottoes between eight and ten thousand carats of diamonds have been extracted. One crystal found there of $726\frac{1}{2}$ carats was called after President Vargas.

Apart from the alluvial deposits in river beds and valleys, there are also some high plateau deposits; Diamantina is 4,100 feet above sea level. These are found embedded in another kind of coarse surface rock conglomerate cemented by red silicate clay known as *gargulho*. In this type of deposit the concentration of diamonds, always found with other minerals, is less, but the stones are bigger and their crystal shapes more perfect.

In South America there are also deposits in Guyana and in Surinam, but these, especially the latter, are of minor importance.

The South African diamond mines are the most recent to have been discovered of those so far mentioned. Their development, therefore, is the best documented, richest in names, dates, places and anecdotes which recall, in fascinating detail, the adventures typical of the pioneering life of the last century. Their history shows how the small beginnings of individual men of initiative grew in a relatively short space of time to major proportions, until the individuals and small groups became powerful companies whose interests are bound up with those of nations.

The first diamondiferous region to be discovered in South Africa was about 625 miles from Cape Town on the then almost deserted steppe of the Karroo, 4300 to 5200 feet above sea level, through which flow the three

ivers, Orange, Vaal and Caledon. This area, which was a patriarchal republic called the Orange Free State, was inhabited by Boers who lived mostly by farming and cattle rearing. Involved in a treaty of alliance with the Transvaal during the Boer War, it was annexed by England in 1900. Ten years later it became part of the Union of South Africa and is today one of its four states.

The children's game of five-stones – colored stones thrown up and caught on the back of the hand – is the first small link in the chain of events which led in 1867 to the discovery of diamonds in this area. Near Hopetown on the Orange River the son of a Boer, Erasmus Jacobs, found while playing near the river a large bright pebble whose irregularity caught his attention. He put it in his pocket together with others he had there, planning to use it in his games. However, one day a neighbor, Schalk van Niekerk, noticed the stone; he wanted to buy it, but was given it for nothing by the boy's mother. He had a vague idea that the stone might be a diamond, but, although he offered it to several traders, they did not share his opinion. Finally, after many fruitless attempts to sell, the lion hunter and trader Jack O'Reilly bought it for very little. He was convinced that this piece of mineral, with which he had managed to write his name on a window pane, must be a diamond, and on the advice of the civil commissioner of Colesberg he sent it to W. Guybon Atherstone, a mineralogist at Grahamstown, who pronounced it a genuine diamond weighing twenty-one carats. As was to be expected the area around the Jacobs' farm was combed for more stones after the news, but no more diamonds were found. Experts in London did not attach much importance to the original find which was presumed to be a freak.

The case was not, therefore, recorded, but rumors began to spread. By the end of that year more than ten thousand people swarmed over the huge previously deserted area along the banks of the Orange River, and another diamond weighing $83\frac{1}{2}$ carats was found in almost the same place as the first one. This stone was named "The Star of Africa." The diligent van Niekerk also wanted to possess this diamond but had to trade five hundred sheep, ten oxen and a horse for it. The temperature of diamond fever rose and bore fruit: nearly everybody found ways of dedicating time to excavating, washing, selling and buying the diamonds which were there.

In Griqualand West in a locality called Dorstfontein a Boer called Adrian J. van Wijk bought a farm from a certain du Toit. One day he noticed that the plaster binding the stones in one of the walls contained little diamonds. The mortar had been made with mud from a pool near the farm. One of the four most famous mines in South Africa, Dutoitspan, was to rise on that site.



Briolette of India, diamond cut in an elongated drop-shape (Harry Winston, Inc.). above right and opposite, from left to right Other imitations of famous diamonds: Florentine, Kob-i-noor, Grand Mogul.

Of the two farms bordering on du Toit's property, one of them, called Bulfontein, was owned by a certain du Plooy, who as soon as he heard of his neighbor's fortune, had no difficulty in getting two thousand pounds for his own land. Here arose the second famous mine of the four mentioned, the Bulfontein diamond mine. The other farm, called Vooruitzicht, belonged to the De Beer brothers who had paid fifty pounds for their 1600 acres. Being shrewder than their two neighbors, they aimed to make some real profit out of it. Their efforts were however unsuccessful, and they decided to sell for six thousand pounds. Later De Beer's farm was to prove the richest diamond mine of all time.

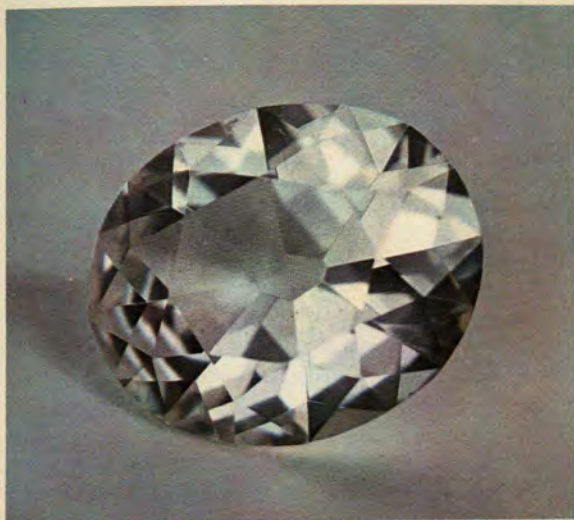
On a hill about two miles from the De Beer's property



were camped some miners who became known as the Red Cap Company, on account of the red berets they wore. One Saturday evening in July 1871, while some of them sat at a game of cards in their tent, they were joined by one of their companions who had just discovered a fistful of little diamonds. The next day the area for miles around was full of prospectors. The reddish sandy earth on which grew thick grass was about three feet deep and covered a thicker layer of limestone; under this was found a stratum of the characteristic diamond-bearing yellow clay, known as yellow ground. At first, the locality was called the Red Cap Company, then New Rush and finally Kimberley.

In this area diamonds were found both in secondary, alluvial deposits and in primary deposits, that is in the mineral strata in which they were originally formed. Crystals of the secondary type are often found near water courses, as are primary ones if they have become dislodged, although at one time it was believed that these were only found in the deep strata of yellow clay. The size and thickness of yellow ground strata are variable (from 33 feet to 2640 feet in diameter and 33 feet to 82 feet in depth) and are surrounded by rock walls of various geological types.

Digging was carried on in enclosures of yellow ground, called claims, for which the miners had to obtain a digging licence. These small areas were often subdivided by private agreements between the miners themselves or ceded according to their fruitfulness at greatly inflated prices. Gradually as the ground was dug away an enormous ever-deepening hole was formed, and the diamondiferous material had to be transported to the surface for the washing and sifting for crystals. At Kimberley the hole, or more properly the pipe, became so deep that electric cables had to be installed to



transport the materials to the surface. Each prospector had his own, and soon the Big Hole resembled a huge spider's web.

Yellow ground is in fact the decayed upper surfaces of kimberlite, the volcanic rock in which diamonds and also other gems are found. The pipes of kimberlite, called blue ground because of its bluish color, come from the depths of the earth's crust from sources that have never been traced. South African mines are usually about 2650 feet to 3000 feet deep, but in Kimberley, which is still mined today, depths of nearly 4000 feet have been reached. The distribution of the gems in blue ground is variable. When the diamond-bearing pipes are very deep, as at Kimberley, a vertical shaft is sunk parallel to them, and from this horizontal tunnels are drilled into the kimberlite.

At this point one must introduce the extraordinary adventures of two Englishmen who played a very important role in the developing of the mining, political and financial activities of South Africa. The first arrived with a Greek dictionary and two thousand pounds borrowed from an aunt; the second with one hundred pounds and forty packets of cigarettes. One lived to the age of forty-nine and the other to forty-four, and they were to come into contact only through the conflict of their powerful financial interests.

Cecil Rhodes was born at Bishop's Stortford, Hertfordshire, in 1853, one of ten children of a rural vicar. He was intended for the Church, but his studies were interrupted by the breakdown of his health, and he was sent to stay with his elder brother Herbert, who was a cotton planter in Natal in South Africa. Herbert, attracted by the news of the diamond discoveries, collected together some money and set off for Colesberg

koppie where the Red Caps had discovered the mine. Cecil joined him soon afterwards, acquired a claim in the De Beer's mine and succeeded in making about a hundred pounds a week out of it. His first ingenious idea was to acquire a pump and offer it for hire to the miners for pumping out the Big Hole. By the age of twenty-one, when he returned to England to continue his studies at Oxford, his health was quite restored by the South African climate, and he was rich enough to repay the loan from his aunt and finance his own studies.

At about the same period another man, of a lower social class than Rhodes, left Southampton for Cape Town. Born at Aldgate, London, in 1852, the son of a Jewish secondhand clothes dealer in Petticoat Lane, he had changed his name from Barnett Isaacs to Barney Barnato. He, too, went off to South Africa to join an elder brother called Henry, and when he arrived at Kimberley he had only thirty pounds and a few packets of cigarettes left. He joined up with a diamond dealer and bought himself a pony at an auction. Barney knew that the animal had been accustomed to wait outside the doors of the more fortunate miners with stones to sell whom his previous master, one of the shrewdest diamond buyers, used to visit every evening. He let the pony unconsciously lead him to the addresses enabling him to obtain the best material for his trading without having recourse to intermediaries. This was the beginning of a colossal fortune.

Breaking with his partner, Barney formed a company in association with his brother Henry and began to buy up claims at the lowest point of the Big Hole at Kimberley. By that time the yellow ground was almost exhausted, and the miners, not realizing that the yellow soil was simply weathered blue ground and that it was in the latter that the greatest riches lay, moved on

elsewhere, thinking the claims were exhausted. The Barnato brothers, after consulting geologists and acting on their advice, bought up claim after claim on supposedly exhausted land, so that before long they controlled a large part of the Kimberley mine. Thus when the blue ground was thoroughly investigated and found to be even richer than yellow ground their fortunes were made.

During the period when Barney and Henry were forming their company, Rhodes, having finished his studies, had returned to South Africa, and at the time when the two brothers' activities were in full swing, he had gained control of the De Beer's mine. Not content with that, he entered into negotiations with the Jewish brothers for their share of the Kimberley mine. Rhodes' ambitions for South Africa stretched far beyond mere financial ones. His dream was to extend the area of British settlement in South Africa and to bring the whole colony under the rule of the British empire. He saw the riches obtained from diamond mining as the means which would give him the power to achieve this end. He later played an active role in politics, becoming first, finance minister at the age of thirty-seven and then prime minister of Cape Colony. In his dealings with the Barnato brothers he used all possible cunning to gain control of all the Kimberley shares against their strong opposition yet remained on good formal terms with them. Rhodes' expansionist ideas impelled him to take over gold mining areas further north in Bechuanaland where he founded the British South Africa Chartered Company, and in this way he set up the region which he himself called Rhodesia. After Rhodes' death the British governor retained this name as he acknowledged Rhodes not only as a hero of colonialism but also for his political work and the anxiety and suffering he had sustained during the Anglo-Boer War.

It seems that Barney committed suicide during a voyage to England by throwing himself overboard. He was a multimillionaire and forty-four years old.

In addition to the four deposits described above, discovered in the short space of six months and all situated in the area around Kimberley, many others came to light around the same time. They were mostly of lesser importance, with the exception of Jagersfontein (discovered in 1870) about 62 miles from Kimberley on a farm belonging to a widow called Visser.

One day her overseer found some garnets in the bed of a stream which skirted the farm. This encouraged him to dig still further and he found a diamond of fifty-two carats. The widow leased concessions on the brook to prospectors for two pounds a month and before long there were about four hundred people there. Finally the woman decided to sell the property for two thousand pounds, thinking she had made a good bargain out of the transaction. The mine, still fruitful today, has revealed splendid diamonds worth millions of pounds. The

Excelsior diamond, which weighs 970 carats, was found there.

Another mine of some importance was that of Welleston, discovered near Kimberley in 1890.

In 1902 the pioneer Thomas Cullinan discovered a very important mine in the Transvaal about 25 miles from Pretoria. When Cullinan went to see the owner of the land, a Mr. Prinsloo, to make an offer for it, he was met with a loaded rifle. Cullinan had to wait until Prinsloo died, when he was able to negotiate with the dead man's sister, who was somewhat more reasonable. The mine, later called the Premier in honor of the prime minister Cecil Rhodes, has proved fruitful right until today and will probably continue to be so. From it came the largest diamond ever found, the Cullinan. It was found on 25 January 1905 and in its natural state weighed 3106 carats. This mine is one of the many that today belong to De Beers Consolidated Mines Ltd., London.

The more recent history of diamond mining features a Canadian engineer called John Thoburn Williamson (1907-58) who, when sent out to a South African gold mine, set about studying the geological aspects of the land. He concluded that in East Africa there ought to be important diamond deposits. The authorities were perplexed to hear from an engineer less than thirty years old that there could be diamonds thousands of miles from Kimberley. In short they thought him mad, and nobody was prepared to listen to him.

Williamson was not discouraged and he headed north for the semideserted area of Tanganyika. His research lasted nearly five years during which time his health suffered. One day, while he was resting in the shade of a baobab tree, he found a diamond: after so much effort he had discovered the deposit he was looking for.

Having acquired the claims, he refused an offer of five million pounds and set up a mine using the most modern machinery and methods. This mine turned out to be ten times greater than the Premier. Today it belongs to De Beers and to the Tanzanian government.

In 1926, close to the mouth of the Orange River on the Atlantic coast, diamond deposits were found in the sand. Alexander Bay and the area around the Buffels river turned out to be quite fruitful. The crystals, carried by the rivers to the sea, were thrown up on the shore by the breakers, but extracting them involved sifting millions of tons of sand because, on average, 30 tons of sand yielded only one carat.

Since 1907 diamond finds, mostly of alluvial origin, have been made in certain parts of Zaire and Angola where, like Ghana, diamond crystals are found together with various other gems. In West Africa (the Ivory Coast, Liberia and Sierra Leone) other minor deposits have been found.

In Australia, particularly in New South Wales, secondary diamond deposits were located in 1851. Although the crystals from this country are very small,

they are also very hard and their powder is used to cut other diamonds. Here diamonds are found together with, amongst others, garnets, topazes and corundums.

In the western and south eastern areas of Borneo diamonds have been found in alluvial deposits and in shingly diluvial heaps. The best production on this island seems to have been during the first half of the eighteenth century and since this is one of the first places in which diamonds were found, the craft of diamond cutting has become a tradition.

During the last century good alluvial deposits were located on the sandy ground of the Ching-Kang Shan Mountains (the diamond chain) near the city of Yi Chéufu in China and these continue to flourish.

The first European diamond, which was of strictly alluvial origin, was found in Russian territory in 1829 in a gold works called Adolfskoy near Bissersk, not far from the very important Krestovovo-zuizcenskoe works. After thirty years' intense research, during which the state organized scientific expeditions to inspect the inhospitable region of Siberia between Krasnoiarsk and Yakutsuk, whose geological features resemble South Africa and India, in 1954 a mineralogist called Larisa Populayeva discovered blue ground up-stream of the Msta River and many good sized diamonds were found.

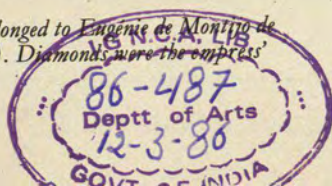
Y. I. Khabardin, who was a geologist taking part in an expedition near the Irelakh River, found a diamond inside a garnet while bathing in the river. He and his companions tried to find the vein, but a fox found it for them: around the edge of its lair blue ground debris was seen, and the deposit was easily located. The mine which was subsequently set up on that site was called the Vein of Peace.

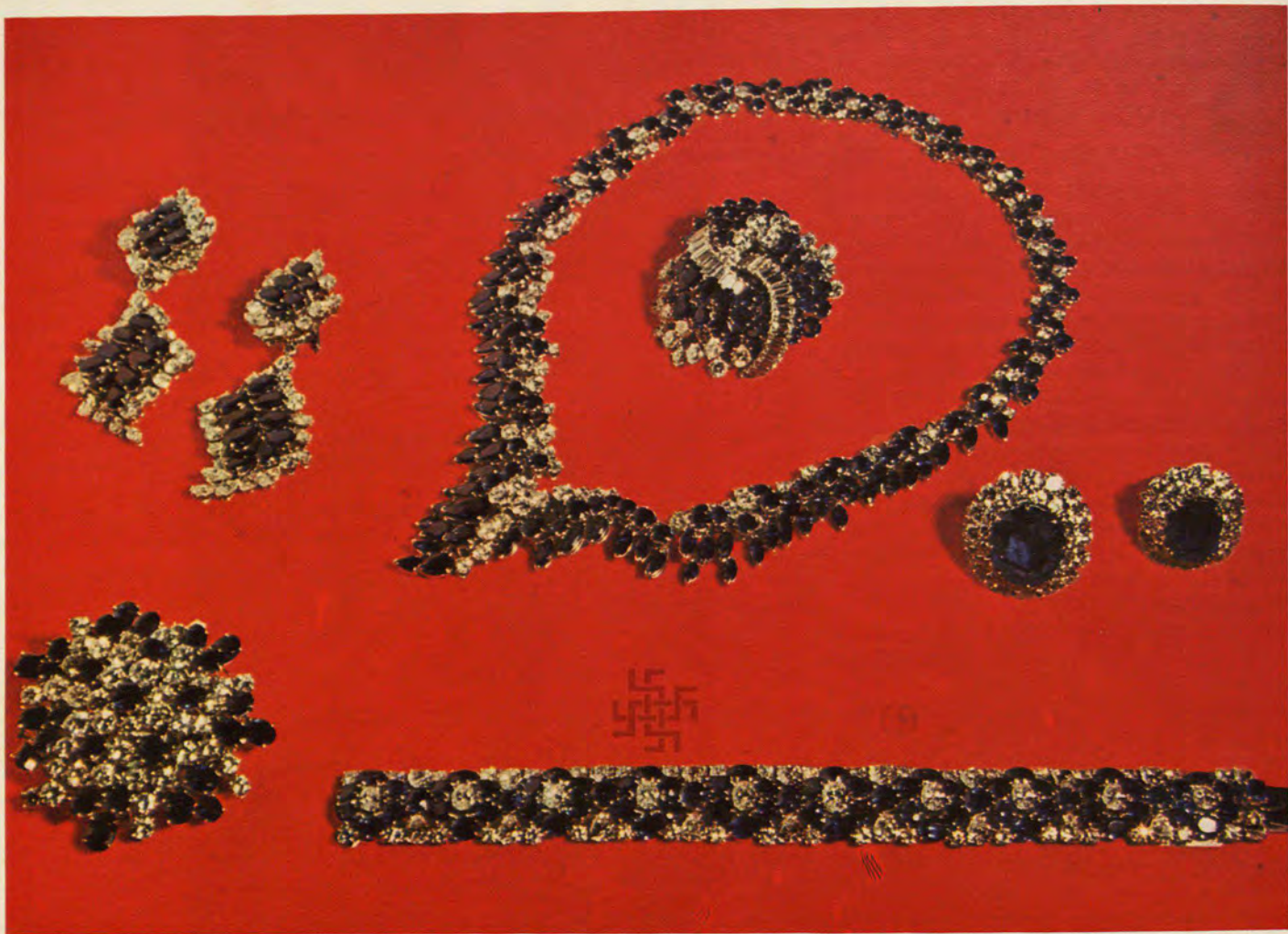
In 1968 the largest diamond ever to be extracted in the Soviet Union was found in Mirni, in the diamond mining area of northern Siberia. The stone was named the Stalingrad diamond in memory of the twenty-fifth anniversary of the battle.

Most diamond mining companies sell the stones they extract to De Beers Consolidated Mines, the company which possesses the greatest number of mines in Africa. The crystals are washed in acid, weighed and divided into those suitable for jewelry and those for industrial purposes, and are then dispatched to London. There they are classified, with the aid of electronic mechanisms, by highly qualified specialists who work in considerable numbers in enormous areas by the light of huge windows. Some experts become so experienced that they can even tell from which mine a stone has come. The classified diamonds are then put into small envelopes which are placed into a small box, known as a parcel, which is submitted to the buyers for examination. The



Diamond brooch which belonged to Eugénie de Montijo de Guzman (Louvre, Paris). Diamonds were the empress' favorite stones.





buyers, however, in examining the parcels, cannot ask for substitutions. Exceptionally large stones are always sold separately from the parcels. Nowadays sales to De Beers take place every fortnight.

After this the diamonds for use in jewelry go to the cutting centers. The most important center used to be Amsterdam, but today it is Antwerp where, in about fifty workshops, more diamonds are cut than in the whole of the rest of the world. Almost all stones of average weight are sent to Belgium and West Germany for cutting; large stones are usually cut in America and the small ones are sent to Israel and India where manual work is less expensive.

In antiquity gems in general and diamonds in particular were chosen for their size and regularity of form. For many centuries it was considered most important not to sacrifice the size of the mined stone by cutting, except when a more regular shape was desired.

The four large diamonds in the brooch of Charlemagne's cloak are uncut octahedrons, called *pointes naïves*. Similar settings are encountered in royal jewelry in later epochs and in some paintings. The inventories of duke Louis of Anjou mentioned shield-shaped diamonds (*façon d'escusson*), an irregular polyhedron with two sloping, triangular sides and two quadrangular ones.

Only in the late medieval period was a little progress made. Six-sided table cutting was very popular in the fourteenth century, either with an upper hexagonal table or an eight-sided rhomboidal one, and workshops for polishing diamonds existed in Nuremberg towards the end of 1368. Further progress was made in Paris at the beginning of the fifteenth century. It is said that the Bruges lapidary, Ludwig van Berquen, cut diamonds with diamond chips in 1475, but this was doubtless a perfection of a technique rather than an invention.



Exceptionally large baroque pearl with a diamond mount, opposite Parure of sapphires and diamonds mounted in white gold (Cartier collection).

stone to suitable dimensions for further work, and gives an almost regular shape to the crystal; bruting gives the stone all its facets; and polishing rectifies any errors, bringing the stone to its final shape, and making the surfaces shine.

The angles and shapes of facets are mathematically worked out so as to produce the maximum fire and brilliance from reflected light. Diamond cuts start from the octahedron shape, a geometric figure like two four-sided pyramids joined together at their bases; exceptions are the rose and table cuts.

In addition to the single, double and full brilliant cuts, the other principal cuts are: round, American, classical, emerald (step or trap), marquise or navette (boat-shaped), square, pear, briolette, rose, table, half moon, triangular, star or Caire, French star and baguette. Less common are the arrow baguette, long hexagon, shield, key stone, kite, heart and old mine. The number of facets may vary from sixteen on a single brilliant to one hundred and fifty-six on a star cut.

The first simulated diamonds were made in England where, it is said, George Ravenscroft was the first producer, having learnt how to make them from an Italian called Da Costa. But in 1657 Villiers had written in his *Journal d'un Voyageur à Paris* that a certain D'Arre in the Temple area was making counterfeit diamonds, emeralds, topazes and rubies and by doing so had become a wealthy man, which shows there was a great demand.

Ravenscroft's "flint glass" was based on lead oxide, a glass of high refraction and dispersive power which, when ground and faceted like a rose cut diamond, looked like a real jewel especially by candlelight. As evening jewelry it was very successful and became very popular, as did the imitation of very important jewelry in the next period.

At the beginning of the eighteenth century Jacobus Strasser gave his name to a glass composition based on lead oxide, which is known as strass today, and this proved to be very suitable for imitating diamonds and various other precious stones (by tinging them with metal oxides).

An important and ancient part of personal precious ornamentation is the pearl. The fascination of pearls, their magical attraction, is well known and has given rise to many legends and stories involving the supposed origin of this extraordinary product of animal secretion. These range from the oriental myth that pearls are the fruit of an embrace between a moon ray and the sea water in the solitary alcove of an open oyster, to the legend that

It seems that Berquen cut three diamonds belonging to the duke of Burgundy, Charles the Reckless, and the duke lost one of them called the Florentine during the battle of Granson. The stone, which was found by a soldier, was sold to a jeweler and subsequently came into the possession of a descendant of the royal house of Austria.

In the sixteenth century the simple rose cut was introduced. The next stage of development was not until 1640, the year in which Cardinal Mazarin commissioned the first brilliant cut (also called Mazarin or double cut). Towards the end of the century the Venetian Vincenzo Peruzzi discovered the triple brilliant cut, and this is still used today. Apart from the two tables, a single brilliant has sixteen facets, a double one has thirty-two and a triple one fifty-six.

The master lapidary's work consists of three stages: cleaving, bruting and polishing. Cleaving reduces the

pearls were born from the tears shed by Adam and Eve on the death of Abel. In Greek and Roman mythology pearls were sacred to Venus who was born by the foam of the waves. In the Christian age, however, we find that pearls are a symbol of purity.

The principal producers of pearls are the *Eulamellibranchia* marine molluscs of the *Meleagrina* genus, which is not really an edible oyster but belongs to the *Aviculidae* family. There are four principal species of the *Meleagrina*: the *Margaritifera* or *Pinctada*, the *Martensii*, the *Vulgaris* or *Fucata*, also called the Ceylon or Californian *Meleagrina*, and the *Radiata*.

The first is the largest (up to 7 inches in diameter) and is found in the seas off New Guinea, New Caledonia, Australia and more rarely the Persian Gulf and Sri Lanka; the second is found off Japan and has a thinner coating of mother-of-pearl than the former; the third, which is larger than the second (about 4 inches in diameter), abounds in the Indian Ocean, the coastal waters of Japan, the Red Sea and the Persian Gulf; the fourth, of medium dimensions, lives in the seas off

Central America. Theoretically, all molluscs, whether salt or freshwater, can produce pearls, since pearl nacre is formed in the same way as the mother-of-pearl with which the inside of shells is lined. The *Meleagrina* has the property of being able to fix itself onto a foreign body by means of two organs (feet and byssus), while the oyster attaches itself by the suction of the convex valve of the shell during its early stages of development; if, for some reason, it is later dislodged it cannot fix itself again elsewhere.

Natural beds of molluscs are generally found at a depth of about 40 feet. In addition to the *Meleagrina*, many other types of molluscs, including the freshwater or *Unionidae*, produce pearls of various colors, but their iridescence, lustre and sheen are very much inferior to that of the four types mentioned above, and they are therefore seldom used in good jewelry.

The body of the mollusc is enveloped in a mantle lined with an epithelium which secretes the substances which harden to form the mother-of-pearl on all the internal surfaces of the shell. This nacreous substance is secreted



in very thin, transparent, calcareous layers which are held together by a network of organic matter called *conchiolin*. When the mollusc opens its valves to feed and a foreign body (a grain of sand, a parasite or something) accidentally gets lodged between the mantle and the epithelium inside the shell, it becomes coated with the secretion and gradually forms a pearl. This can be produced in various shapes, the most common being round, pear, button and the irregular or baroque. More than one pearl can form in one mollusc, but it is more likely that there will be none at all, for only one in a thousand molluscs fished up contains a pearl. The button pearl or half pearl is produced when the pearl-sac starts forming near the shell and becomes attached to it, so that a hemispherical pearl is formed.

Pearls take their color from the pigments contained in the *conchiolin*, and each species has its characteristic color. Apart from black pearls, there are extremely rare pink pearls (found in the great conch or fountain shell of the West Indies: *Strombus gigas*), and also those of bronze, green, greenish-blue and shades of lavender. The so-called blue pearls show on X-ray examination a large nucleus with a thin nacreous covering.

In many areas pearl fishing is still carried on by native men and women divers working with traditional methods. Each dive lasts about eighty seconds and each fisherman makes about thirty to forty dives in a day. The work is dangerous and the divers are often subject to an early death or paralysis. Their equipment consists of a rope weighted with a stone along which they descend to the sea bed, a sort of clothes peg device to keep the nostrils closed, leather finger-stalls to protect the fingers while the molluscs are gathered and a basket in which to put them. In one dive a fisherman can collect about forty to fifty oysters.

The best divers are the Arabs. In Japan pearl fishing is carried on exclusively by the young "daughters of the sea" who use somewhat more up-to-date methods in their difficult work. In Central America diving suits are used by pearl fishers, which means that the work is less tiring and the divers can take their time over choosing only the largest oysters so as not to impoverish the bank.

The *Meleagrina* have natural enemies too, capable of destroying whole banks of them. Among the most rapacious are sea urchins, rays, mullets and gastropods. Other enemies are certain worms, coelenterates, sponges and protozoa.

There are various ways of extracting the pearls from the molluscs. In the best organized fisheries the molluscs, after being assembled in the workshop, are opened and searched for pearls and the mother-of-pearl shell is examined for any button pearls which may be embedded in it. Sometimes the molluscs are laid out in

the sun so that they decompose: then the animal is extracted by its valve, washed and sieved. Scientific X-ray techniques are used today in some places to see if the shells contain a pearl: if not, they are thrown back into the sea.

When they are extracted from the shells, pearls are covered with a sort of light greenish coating which is easily removed by washing in a solution of alcohol or ether. Those intended for mounting are only partially perforated while those to be used in necklaces are drilled right through. Irregularly shaped pearls can be reduced to regular forms by removing some of the outer layers; however, this delicate operation can result in unfortunate surprises if the stratification is not uniform.

First the Chinese and later the Japanese tried by various means to insert metal or mother-of-pearl spheres into a *Meleagrina* mollusc to bring about production of a pearl, but the best they managed to obtain was a half pearl. More recently, in 1913, a Japanese called Kokichi Mikimoto managed to obtain real pearls (cultured pearls) by breeding molluscs in metal cages, each capable



left An oyster containing a pearl. right Another large baroque pearl with a diamond mount.

of holding a hundred of them, which were placed on sheltered sea beds. At the third year the molluscs were gathered and underwent a very delicate operation consisting of planting in the mantle a tiny piece of epithelium taken from another creature containing a tiny nucleus of mother-of-pearl. After a period of between three to seven years, pearls developed.

The imitation of pearls is an industry which has become very popular since it started in the sixteenth century. Queen Elizabeth I, not being able to obtain all the pearls she required, used to buy false ones to embroider her clothes.

Imitation pearls can be divided into two major categories: the blown glass pearl with a hollow center known as the *parigine* or French pearl, and the Roman pearl made from an alabaster bead covered in a mother-of-pearl mixture.

Stories, some fictional, of extraordinary pearls in antiquity have been passed down to us. Julius Caesar sent Brutus' mother a pearl worth six million sesterii and Caligula's wife, Lollia Paulina, had a jewel containing pearls worth forty million sesterii, which was part of plunder from the east.

One of the most famous eastern pearls is the Great Cross of the South. It consists in fact of nine pearls joined together: seven are in a straight line and the other two are joined on in such a way as to look like a cross. It was found in an oyster in 1866 on the west coast of Australia and is now part of the British crown jewels.

Among the fabulous jewels belonging to the Gaikwar of Baroda kept in the Nazar Bagh Palace in India was a rug made entirely of pearls bordered with precious stones.

The largest known pearl in the world is the Pearl of Asia which weighs two thousand four hundred grains. It is shaped like an aubergine and has been mounted with other large pearls and rose-colored jade. It is apparently kept in a London bank.

Another exceptional pearl, which weighs eighteen hundred grains, was part of the gem collection of the banker Philip Hope.

In the seventeenth century when diamonds came to the fore in jewelry, coral, a much less valuable gem, also became very popular. It already had a long and distinguished history for archaeological finds have proved that coral has been in use since the evolution of the Mesopotamian civilization. The Egyptians used a great deal of magnificently carved coral for necklaces, rings, scarabs and charms of all kinds. From the ancient Greek to the medieval era the most popular and functional piece of jewelry was the brooch, and this was often decorated with coral. The Greeks also used a certain amount of coral in other jewelry while the Romans used it more widely for rings, charms and pendants with portraits of various figures carved in bas-relief, as well as for many kinds of beads in necklaces,

bracelets and armlets.

From the earliest times India has always been a great importer of coral and this was mainly used in the manufacture of the many different kinds of local jewelry. Here, and in the Far East where it was widely used for personal ornaments, coral was considered to be of great value as well as being endowed with magical powers.

Documentary evidence from the thirteenth century shows that coral fishing was controlled along the Mediterranean coasts because of heavy exploitation, yet the existing examples of medieval jewelry do not bear this out. Coral has only been widely used for jewelry since the sixteenth century, and in the seventeenth and eighteenth centuries it became even more popular and made a major breakthrough all over Europe.

Until the eighteenth century it was believed that coral was a form of marine vegetation. However, this theory was disproved by Peyssonel, a doctor from Marseilles, who discovered that coral was the skeletal remains of the minute coral polyp, which reproduces itself from eggs and secretes calcium carbonate. They live in colonies in warm shallow water where their skeletal remains gradually build up into banks of coral.

Coral is mainly fished in the Mediterranean, off the coasts of Sicily, Sardinia, Corsica and other small islands, and along the coasts of North Africa, Provence and Liguria down to Leghorn.

The Tunisian government has divided its coral sea coasts into ten sectors, only permitting fishing in one sector every year, so as to give the banks time to grow again. The fishing is carried on by traditional methods with a wooden dredging device made of two long, thick beams in the shape of a cross with a ballast at the center; at the ends are fixed iron hooks called scrapers in the middle of a tangle of nets. This dredger is lowered into the sea over the coral bank by means of a long rope and is then scraped backwards and forwards so that the hooks catch on the coral branches, toppling them into the nets.

In Japan, where a similar device hauled up on a bamboo cane is used, coral banks are now being exploited very intensely. Japanese coral, some of which is imported to the west, has usually got more branches than the Mediterranean variety and is preferable for industrial production for various reasons.

Other recent coral banks which are considered to be quite important can be found around the Canary Islands, the Antilles and around the Cape of Good Hope.

Black coral is a product of the horny skeleton of certain species of polyps and only comes from the Red Sea, an ancient coral fishing site. In jewelry the dark red, red, pink, pale pink and white are used. There is also a rare variety of blue coral called *acori* which comes from the west coast of Africa off Cameroun.

Nineteenth-century coral parure of the Louis Philippe period (Musée des Arts Décoratifs, Paris).





Gold in antiquity: jewels recovered by archaeologists in the tombs of the ancient kings

Many ancient tombs containing funeral treasures have been found intact. These have been, and continue to be, sources of interesting precious objects which, in accordance with religious beliefs, were buried with or on the body of the person to whom they had belonged. Today, thanks to archaeological finds, we can trace the development of the styles and forms characteristic of the jewelry from the various areas or regions of the earliest cultures known to us. Relics of the distant past are scarce for obvious reasons: this is due to various causes, not least that of melting down and reusing precious metals.

It would appear that by the fifth millennium BC various tribal groups of the ancient world were beginning to reject their nomadic life for a more settled existence, and by the beginning of the third millennium important social groups were rapidly developing. The largest organized societies, or at least those whose expansion is registered in history, appear to have chosen fertile river valleys for their settlements. The Sumerian civilization of Mesopotamia began in the regions of the Tigris and Euphrates, the Egyptian civilization developed around the Nile, Troy was situated on the Scamander, the Indian civilization arose on the banks of the Indus and the Chinese one along the course of the Huang Ho, the great Yellow River. These areas were also untapped sources of precious minerals, which were the primary materials in the manufacture of jewelry.

It seems logical to start with Mesopotamia where, by the second millennium BC we find indications that the Sumerian civilization was already well developed. Turning our attention to jewelry we can establish that most of it was made entirely of gold, rarely including colored stones such as lapis lazuli or cornelians. Apart from the ancient civilizations of the Indus and Nile, which showed from the beginning a predilection for

*Large gold fibula decorated with granulation and stamping,
from the Regolini-Galassi tomb, Etruscan, seventh century BC
(Museo Gregoriano Etrusco, Rome).*

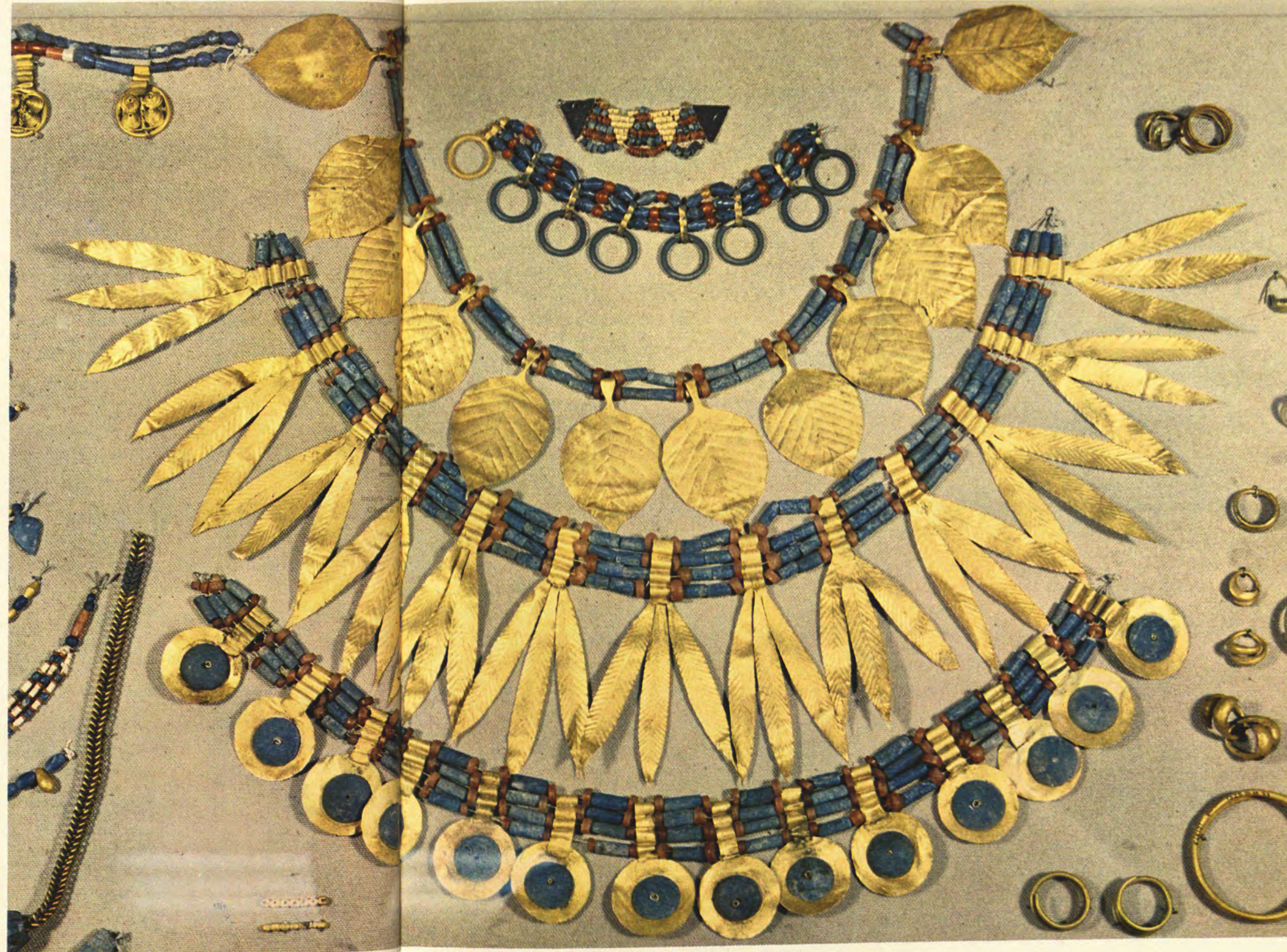


The skull and jewels of a Sumerian woman, from the royal tombs of Ur (Bagdad Museum). right Sumerian jewels in gold and faience, from Queen Shubad's tomb, Ur (British Museum, London).

colored jewelry, until the Alexandrian period jewelry was made entirely of gold.

The ruins of the city of Ur, situated in the south of the Mesopotamian region about twelve miles from the Euphrates, were visited for the first time by Pietro della Valle (1586-1652). However, the region was only identified as the Ur of the Chaldees (which the Bible indicated as Abraham's native country, now in Iraq), in 1854 by J. E. Taylor, the English consul in Basra, through a cylinder seal which he found at the site.

From 1922 widespread systematic excavations were carried out over a period of twelve years (that is to say twelve seasons, as excavation only took place in winter) by an archaeological expedition sponsored by the British Museum, London, and the University of Pennsylvania and led by the English archaeologist, Sir Leonard





Hittite ring. right Earring, Phoenician-Punic, sixth century BC. below Achaemenid bracelet from the Ziwiye treasure. opposite Mycenaean gold pendant of hornets from Chrysolakkos, seventeenth century BC.





Woolley. The discovery during these excavations of the so-called royal tombs constituted the greatest and richest archaeological discovery since Tutankhamun's tomb.

In one of these tombs were found the remains of Queen Shubad covered with a jeweled robe, which it was later possible to reassemble. In his book *Excavations at Ur*, Sir Leonard Woolley not only describes in detail the precious ornaments worn by the queen but also the sovereign's burial ceremony which, as the remains revealed, involved the customary suicide of the servants, musicians, dignitaries, ladies-in-waiting and guards. For the funeral procession everyone wore the richest jewelry and finest clothes. From the goblets, plates, bowls and other relics the very high degree of culture reached by the people of the third millennium BC can be appreciated. That is to say when European man was still living in caves, the royal court at Ur listened to concerts, the ladies wore cosmetics and padded wigs and the soldiers had swords and gold helmets. Beneath this luxurious and fascinating exterior there was obviously a social structure which, aided by the invention of writing, must have resembled commercially and administratively that of today, which is why it has been justly said and recorded that history begins with the Sumerians.

As far as jewelry is concerned, knowledge of the

various techniques was very advanced. The royal tombs at Ur contained a great many gold and silver objects which were often studded with lapis lazuli and cornelian, or sometimes with agate, chalcedony or white shells. All this material was brought from distant places, its transportation made easier by the invention of wheeled vehicles (examples of which were also found in the tombs), and which the Egyptians learnt about nearly one millennium later (in 1700 BC).

In Sumerian jewelry symbols of nature, notably the sun and the half-moon are often reproduced. Vegetable motifs such as leaves and flowers, are realistically illustrated as are animal figures like gazelles, cats, bulls, goats and fishes which usually decorated large hairpins or were carried as charms. Earrings, usually made of gold and half-moon shaped, and numerous bracelets were worn by men as well as women. Necklaces and bands were frequently made up of tubular-shaped links with alternate clusters of lapis lazuli and cornelian of various sizes. Rings were smooth and rather bulky and the bezel often held a polished lapis lazuli. This highly refined jewelry indicates that the goldsmiths' expertise goes back many centuries before the calculated date of these pieces.

Chronologically less ancient by a few centuries is the

archaeological discovery associated with Heinrich Schliemann (Neubukow 1822–Naples 1890). Gold jewelry of the so-called treasure of Priam was found on the Hissarlik Hill in Turkey, which is the ancient site of Troy, situated between the Scamander and Simoenta rivers. There were diadems, earrings, rings, prisms, perforated cubes, bracelets, and necklaces, more than eight thousand pieces “worked with the highest artistry” in thin sheet gold and molded into multiple pieces hanging from tubular chains. A collection of this jewelry, which dates back to 2300 BC, is worn by Mrs. Schliemann in a photograph taken in 1873 at the time of the excavation.

These pieces are far removed from the stylistic forms of the Ur jewels. Here the moldings of the light

right *Greek pectoral ornament from Rhodes, seventh century BC, consisting of seven plaques stamped with a winged goddess between two lions (British Museum, London).*

pendants, vaguely reminiscent of floral motifs, were primarily designed to sparkle, hence their extreme mobility. They do have a strict, stylistic unity even if they lack refinement, and although they are less advanced than the Ur jewels, they are perfectly in keeping with the concept of precious ornaments. Unfortunately most of this treasure was lost during the Second World War, but one or two examples can still be found in the Archaeological Museum in Istanbul.

While the stylistic design of this Trojan jewelry is only an isolated example from that region, in Mesopotamia,



Gold diadem, the ends of which are decorated with pear-shaped bullae and winged horses, found in a tomb at Vix, France. It is thought that it is early fifth century and of Greek origin like other objects found in the same tomb.



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Sumeria, Akkad, Elam and Babylon extensive centers of goldwork were developed which finally expanded and their art spread to northern Iran. The Scythians from the north, who had a long history of metalcraft and stylistic design, especially of animal figures, joined in too, and their art in turn influenced the Hittites in the west.

Evidence of this long period (lasting from the second millennium BC to the fifth century BC) is very scarce and is largely to be found in the sculptures and plaques of the cultures mentioned. The British Museum has the most important and ancient jewelry collection from this period. The Archaeological Museum in Teheran houses most of the Ziwiye treasure together with many pieces from the Achaemenid period, and the Hermitage in Leningrad has the richest collection of Scythian goldwork.

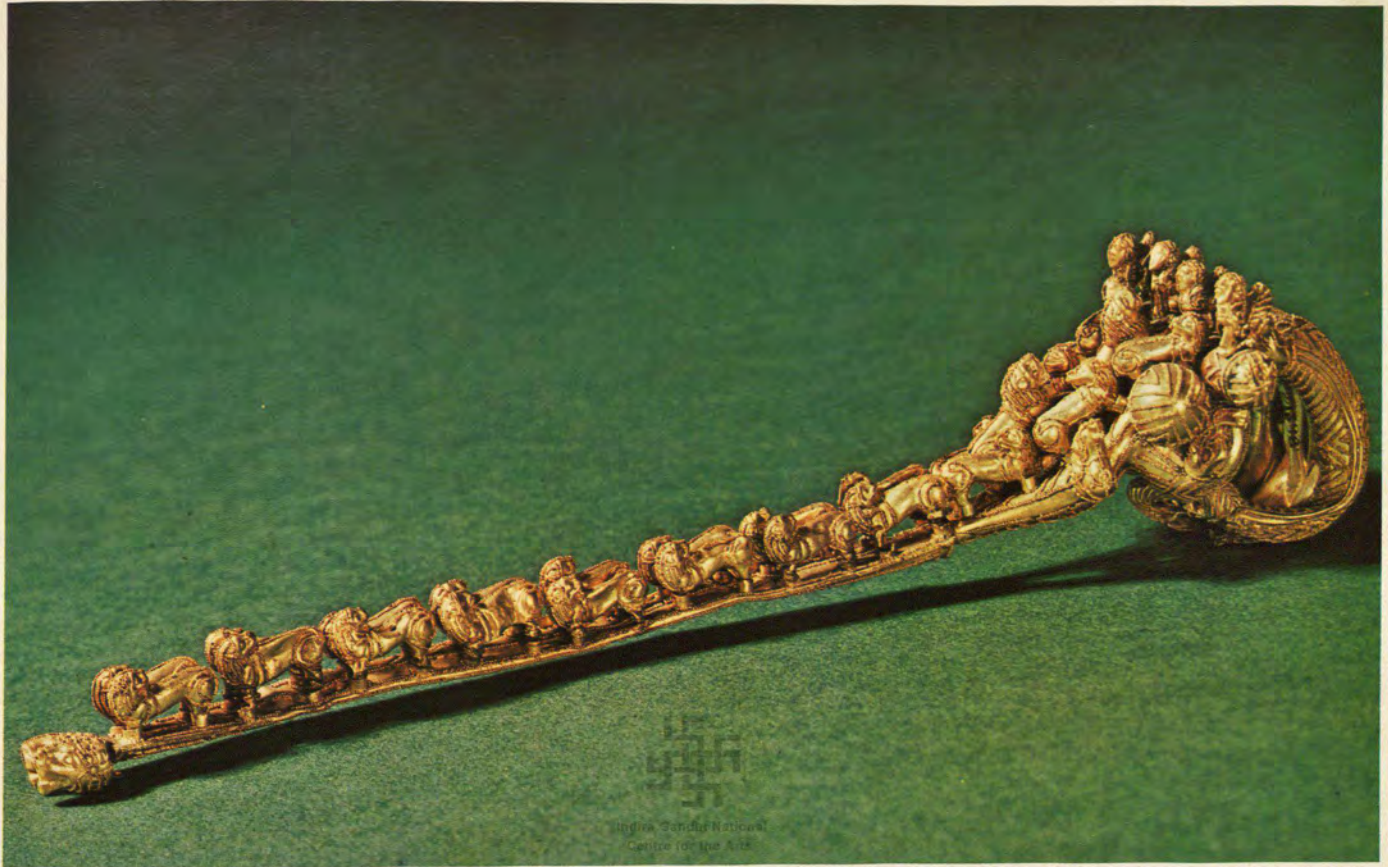
The next most ancient jewelry of the west, after Troy, dates back to the second millennium BC and was produced in the eastern Mediterranean basin. Minoan-Mycenaean examples of the seventeenth century are highly developed, indicating an ancient tradition in metalwork. One can see that Egyptian art influenced the production of some articles, which is especially noticeable in the jewelry from Cyprus and Rhodes. The best examples have come from excavations in Mycenae, Tiryns and Crete.

The styles and subjects found in Minoan-Mycenaean metalwork are wide ranging, dominated by an intense interest in nature, which is often represented with a high level of realism. The rich variety of decorative subjects ranges from sea creatures to flowers, from wild beasts to timid deer, and even bees, and from fierce hunting scenes to the dynamic rhythms of popular dances. All the subjects depicted are characterized by linear patterns which express a very great artistic understanding. The variety of metalwork lead the craftsmen to use the technique of stamping for mass production. At Mycenae Schliemann found 701 stamped discs in one tomb alone which were used for decorating clothing. From a technical viewpoint filigree and granulation were extensively used in more worked pieces of jewelry.

Among the most important traders and colonizers during the first millennium were the Phoenicians. They made a significant contribution to the spread of eastern art forms and the technique of granulation in the Mediterranean. Their trade extended to the Iberian peninsula. Stylistic influences from various places can be seen in Phoenician-Carthaginian jewelry, for example Egyptian, Creto-Mycenaean and oriental. This jewelry is more to be admired for the technical ability than for the creative flair or stylistic unity.

The Phoenician craftsmanship was taken up by the





Etruscans. In learning the technical aspects, these people created original designs which were imaginative and incredibly skillful. A wealth of new decorative patterns, worked with minute filigree and granulation of various kinds, bestowed richness and value on Etruscan jewelry, which was made entirely of gold.

The characteristic designs of Etruscan jewelry pervaded fibulae, breastplates, sword belts and earrings with figures of sphinxes, lions, chimeras, ducklings, human heads and floral motifs, all elegantly traced in silhouette and granulated onto the gold surfaces of the jewels. Some of these ornaments can really be looked upon as miniature monuments to Etruscan jewelry. The excavations of Caere, Tarquinia, Vulci, Praeneste and Vetulonia have uncovered a number of jewels of considerable importance.

A wheel-shaped beaddress covering the ears, gold bands across the forehead and a rich necklace are worn by the "Lady of Elche," Phoenician-Punic, fourth century BC (Prado, Madrid). above Gold fibula, Etruscan, seventh century BC.

The use of gold in jewelry (except for necklaces and rings) was also prevalent in Greece in the sixth century BC, which at that time had acquired an unprecedented artistic and cultural superiority. But between the sixth and fifth centuries personal ornamentation was not very popular which was partly due to the strict sumptuary laws. Jewelry, and in particular ring bezels, of the classical period, inspired by contemporary sculpture, frequently portrayed the human figure which usually represented a god, either standing or moving. Representations of Silenus, Aphrodite, Hermes, Perseus, Athena, Eros and Nike were part of the metalworkers' repertoire, and there are numerous examples of excellent artistic quality. Besides the leech and disc-shaped earrings, new shapes included anchors, bunches of grapes, upturned pyramids, palmetto, spiral and hoop earrings with finials decorated with women's heads, rams' skulls or floral motifs.

The scarcity of Greek jewelry of this period is partly counterbalanced by literary evidence. We know that Phidias' great gold and ivory statue of Athena in the Parthenon had rich necklaces and cluster earrings, and the head of Zeus was encircled in a golden wreath. Other



Scarab ring, Asia Minor (c. 350–330 BC). below Roman necklace of gold mesh, emeralds and mother-of-pearl, from Pompeii, first century BC (Museo Nazionale, Naples). right Gold and garnet bracelet, Eretria, Greek, fourth to third century BC.

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temple statues were also embellished with gold and must have called for frequent and close cooperation between sculptors and goldsmiths, greatly to the advantage of the latter. Some idea of the variety of precious ornaments in use is gained from the inventories of temple treasures; among the objects given as offerings were numerous bracelets, armlets, buckles, pins, earrings, rings and necklaces. Two exceptional pieces are the Sphinx pin and the Capital pin, which are now in the Boston Museum, and their complex composition demonstrates the great talent of the artist.

While it must be appreciated that historical/political dates in relation to the history of art are really only indicative, in the fourth century, at the time of Alexander the Great's accession to the throne in 336 BC, a stylistic change in jewelry and a sensational increase in production took place. Many factors contributed to this change, but it is a fact that Hellenism was firmly based in Greece and that this new artistic concept was a reaction against classicism, was partly due to territorial expansion, and was strongly influenced by eastern art forms.

Very soon the taste for lavishness which spread from the court, and was subtly influenced by a great number of Persian brides who had been transferred onto metropolitan soil, had a significant effect on jewelry so that a lady of a reasonably high social status would be expected to possess a set of jewels including a diadem, bracelets, a belt of worked gold, rich pendants, composite necklaces and luxuriant earrings.

Towards the end of the fourth century precious stones began to appear in Greek jewelry. At first garnets were used in the bezels of rings which were not intended as seals and then, though very sparingly, in diadems, necklaces and bracelets. Occasionally emeralds imported from Egypt, sardonyx, agate and rock crystals also appeared.

The great quantity of finds indicates that Hellenistic jewelry production flourished not just in Greece itself, southern Italy and Sicily but in the many peripheral workshops, in Asia Minor and the Middle East to southern Russia. Obviously there were local stylistic variations but Hellenistic jewelry was basically homogeneous throughout this vast area, and a high average level of quality was maintained. Since jewelry was easily portable and goldsmiths often traveled, introducing elements from their native countries into their work, the place where jewelry is recovered is not necessarily the place where it was produced.

The jewelry of this period can be denoted by the numerous new decorative motifs and the special attention which was paid to detail. Frequently diadems, earrings or pendants would be embellished with the figure of a god, either tondo or in high relief. The Heracles knot was very fashionable for belts, necklaces and diadems, as were disc-shaped earrings (which usually included a multipetaled flower), and pendants in the shape of amphorae, decorated with filigree and





granulated motifs, hung on light chains.

Apart from the exquisite technical quality and the richness of Hellenistic jewelry archaeological discoveries have brought to light examples of exceptional artistic quality which must have been carried out by important sculptors of that time. Among these are two earrings which are very similar. One, which is kept in the Boston Museum of Fine Arts, shows a chariot, driven by Nike and drawn by two rearing horses hanging from the clasp; in the other, kept in the Archaeological Museum in Athens, the chariot is driven by Cupid. Another very refined piece of jewelry comes from Taranto, but the purpose of it is still uncertain. It consists of an openwork skullcap made of gold wire, festooned with garnets, and surmounted with a medallion depicting Medusa in high relief.

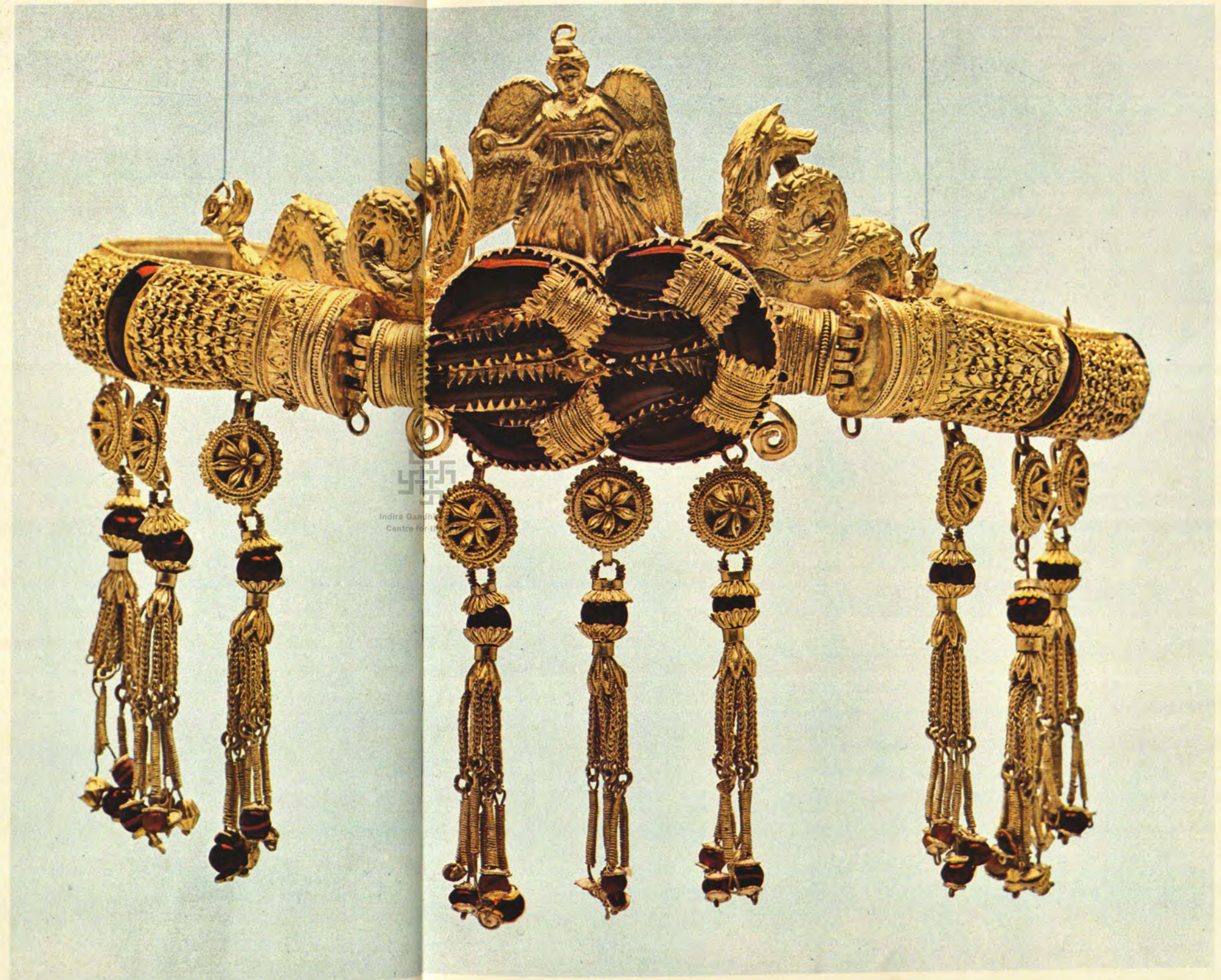
The fabulous tubular diadem found at Vix (near Châtillon-sur-Seine) has, in my opinion, very refined Hellenistic characteristics as its shape is derived from torques of eastern origin, and the two small winged rampant horses which make up the design are taken from Greek mythology. I do not believe it to be before the period of Alexander the Great's conquests.

The serpentiform bracelet was introduced in the Hellenistic period and the most striking example, due to its complex composition of curves, can be seen in the Schmuckmuseum in Pforzheim.

Bracelets of all shapes were embellished with designs from an inexhaustible decorative repertoire. Some were made of finely perforated bands engraved with vegetable motifs while others, which came from the east, were rigid, twisted and open with animal heads at each end, or smooth with a bust of a god carved into the metal. There were also many types of combs decorated with heads, animal figures or gods. Fibulae were bow-shaped, tubular and molded and minutely embellished. The ends were decorated with tondo heads or some other design. Alternatively they were leaf-shaped and the ends were molded into a motif.

Gold belts were usually made of complicated interlocking links, and frequently the clasp was decorated with a Heracles knot or with human or animal heads.

Animal heads and serpentiform motifs were repeated on the rings of this period. The ones with a gold bezel, which was usually oval, were engraved in reverse (for signet rings) or in relief with various designs which, compared with the classical period, had a vital and naturalistic quality which characterized Hellenistic art.



Hellenistic diadem from Kersch, second century BC. preceding pages Detail of gold ornament from the Barberini tomb, Etruscan, seventh century BC.



Jewelry and color : Egypt, India, Rome. Amulets and talismans

The arts of metallurgy and gem cutting and the use of color in jewelry were from the beginning used with more restraint by the peoples of the Nile civilization than by those of Southeast Asia and the Indian subcontinent. Although they were influenced in the earliest stages by Mesopotamian motifs, they later developed characteristics and expressed themselves in forms and rhythms which were entirely their own, bound up with their ceremonies and emblems of dynastic pomp and religious and magical beliefs. The succession of dynasties lasting for centuries in Egypt allowed expressive forms to develop and consolidate, producing sumptuous and spectacular works of art in every field on a level which had never been attained before and still amazes the world. At the court of the pharaohs the god-king was surrounded by a profusion of gold, gems, colors and precious materials in a dazzling and exciting atmosphere of stupefying splendor.

Bracelets and amulet figures found in tombs of the Thinite era (3007-2780 BC) near Abydos and Naqada give us some idea of the already high level of workmanship and stylistic motifs in gold and jewels. The bracelets are composed in turn of amethysts, lapis lazuli and turquoises, and the working of the metal was clearly considered of equal importance as the value of the gems.

The wearing of jewelry in those times was entirely restricted to the pharaohs and their families, the priests and other functionaries within the circle of the court. The Egyptians knew of gold before silver, which at first they called white gold. The metal of the sun, the planet personified by their chief deity, Aton, was the favorite. Unfortunately few tombs of kings and dignitaries have not been plundered, despite the special devices to foil thieves with which they were built. The tombs that have survived intact, together with colored statuary and mural paintings, form the most valuable sources of our knowledge of the forms and techniques used in the making of precious ornaments in ancient Egypt.

A rare find from the epoch of the Old Kingdom, which lasted from the third to the seventh dynasty (2615-2175 BC), was the tomb of Queen Hetepheres I, wife of Snofru, near the Giza pyramid. In the tomb were found all the furnishings which, according to religious beliefs, would provide for the comfort of the deceased in the afterlife and be worthy of her lineage. The bed, the throne and a litter are extensively embellished with solid

Earring in gold and semiprecious stones, Egyptian, eighteenth dynasty (Egyptian Museum, Cairo). A profusion of gold, gems, precious materials and color pervaded the pharaohs' court.



gold *repoussé* work and gold leaf encrusted with precious stones. Among the jewelry there were silver bracelets, with butterfly motifs composed of turquoises, lapis lazuli and cornelians.

In this period gold was so much more plentiful than silver, which had to be imported, that the latter assumed a superior value to gold. A silver belt which belonged to a prince has been found and is now in the Egyptian Museum in Cairo. It consists partly of a broad band decorated with pearls and beads of red and black stone set in rhomboid patterns, and partly of a panel carved with hawks, symbols in openwork and two seated figures on either side. Of the same period are the painted stone statues of Prince Rahotep and his wife Nofret, conserved in the same museum, which show the bridal pair bedecked with necklaces and diadems encrusted with semiprecious stones.

With the expansionist activities of the twelfth dynasty (the Middle Kingdom) new territory was conquered in the upper reaches of the Nile Valley above the Second Cataract. This brought the gold mines of Nubia within the grasp of the Egyptians, and the resulting increase in the creation of gold objects and jewelry. By the second millennium BC the skills and techniques of the craftsmen in these fields had reached a level of artistic achievement which was amongst the highest ever attained by an Egyptian civilization.

The pectoral of King Sesostris III, found at Dashur with those of Sesostris II and Amenemhat III and conserved in the Egyptian Museum in Cairo, is, in its balance, rhythmic composition and harmonious use of color, one of the most beautiful works that has ever been created. It has a characteristically Egyptian design of a frame containing a scene depicting apes with hawks' heads trampling on the vanquished, which symbolizes the pharaoh's victory over his enemies. It is in gold openwork, outlined in semiprecious stones, arranged and set in strict symmetry around the central symbol which is surmounted by a vulture with outstretched wings. The beauty of the piece is skillfully enhanced by the use of various shades of blue and red and by the yellow of the gold. The necklace from which the pendant hangs is made of round and oblong beads of gold and cornelian. The other two pendants, executed in the same style and with the same skill, are decorated with symbolic animals, hieroglyphics and other emblems and human figures vividly portrayed.

During this period of cultural development relations between Egypt and the Creto-Mycenaean world were established and stabilized, resulting in a noticeable influence on the jewelry of the pharaohs. However,

left Earrings and headdress of one of the wives of Thutmose III, Thebes, eighteenth dynasty, (Metropolitan Museum of Art, New York. Funds from the Huntley Bequest, 1958). right Large collar in gold and faience from Tutankhamun's treasure, eighteenth dynasty.





Necklace with pendant in the shape of a vulture, symbol of the goddess Nekhebet, from Tutankhamun's treasure.

motifs inspired by the Minoan gold craft, while benefitting the Egyptian techniques, were soon absorbed into the native tradition so that one cannot detect any alteration in the chromatic and structural components which constitute the fundamental character of Egyptian products.

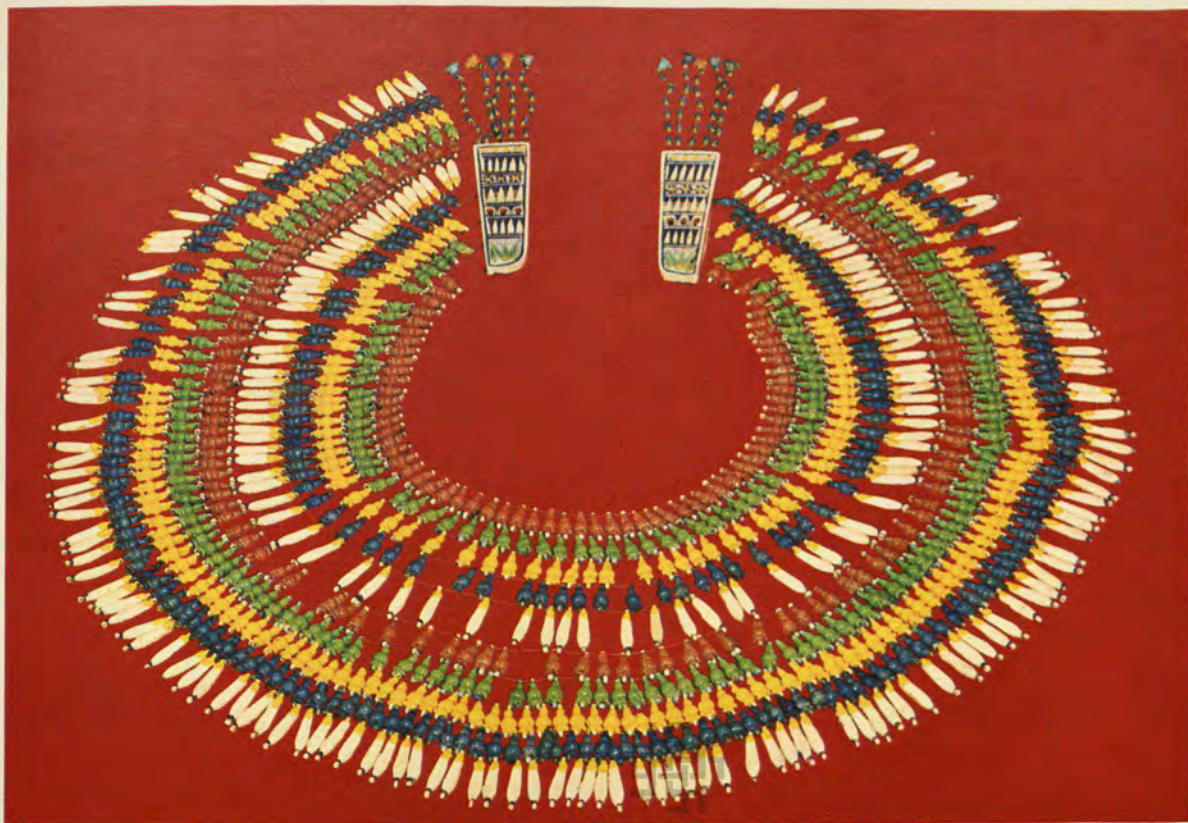
During the invasion and ensuing domination by the foreign kings, the Hyksos, there was a decline in the arts and in the standard of life in general. The eighteenth dynasty, with which the New Kingdom (1570-332 BC) began, initiated one of the most brilliant periods in the history of Egypt. Prosperity returned and with it precious ornaments, many of which fortunately for us followed their owners into their tombs.

The most amazing example of the richness of the funerary objects, which it was customary to place with a dead pharaoh, was found in Tutankhamun's tomb discovered in 1922 by Howard Carter. The young king had died at the age of eighteen and had already ruled for nine years. It is thought that work on his tomb and the preparation of all it contained was probably begun as soon as he ascended the throne or soon afterwards. It was like a small museum, full of exquisite objects demonstrating the high standard of craftsmanship of the period, and the most complete record of all the contemporary goldsmiths' and jewelers' techniques, from the cutting and molding of semiprecious stones to enameling on gold or maiolica, from damascening to filigree.

The motifs used in Egyptian jewelry are mostly either figures of gods, planets (most often the sun) or symbolic abstract forms. Other figures are personifications of animals, which indicates the totemic and fundamentally magical origins of the religion. The hawk, vulture and cobra appear most frequently on the ornamental objects appertaining to a king or queen. The form of a cobra usually rises from the center of the pharaoh's mitre, while a gold vulture encrusted with gems would cover a queen's headdress with its broad wings, its head above the center of her forehead. The sun disc and the symbol of life in the shape of a T, with an oval knot at the point where the bars cross, are emblems which constantly recur in necklaces, bracelets and pendants. To add color, lapis lazuli, turquoises and cornelians were widely used, as well as glazed enamels.

Earrings began to be worn in Egypt after the twelfth dynasty and were generally simple in shape: hoops or round discs or sometimes in the form of bullae. On a bas-relief, found in the Valley of the Queens at Thebes and now in the Metropolitan Museum, New York, the figure of Queen Nafertari wears earrings in the form of battle-axes and band bracelets of black and white interlocking rectangles with borders of dark pearls. The clothes shown on the relief are adorned with pieces of gold and even the pharaoh's footwear is made of gold and gems.

The style of necklace most commonly worn by both men and women consisted of a semicircle of parallel



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Polychrome necklace from Tutankhamun's treasure, Egyptian, eighteenth dynasty (Egyptian Museum, Cairo).

strips, compact and many colored, fastened at the base of the neck. Some were also made of rows of tiny beads of various shapes, using rock crystal, amethyst, green feldspar, garnet and obsidian. Beads made of precious stones were nearly always interspersed with gold ones.

In those days turquoise was brought from the Sinai peninsula or Arabia; rock crystal and amethyst came from the mountains of southern Arabia while obsidian came from Ethiopia. In ancient Egypt there was intense production of a faience substance made of powdered quartz, lime and soda (natron) and covered with an alkaline glaze, which was used for making beads for necklaces or to provide colored bezels in gold jewelry. The colors usually imitated those of lapis lazuli and turquoise and therefore varied from dark blue to a light blue-green; the coloring agents were cobalt and copper respectively. Objects of this glazed composition such as amulets and scarabs were usually cast from clay molds.

The emerald, which was already known and used in the time of Sesostri II in the nineteenth century BC appeared in limited quantities in Egypt. It is rarely found in Egyptian jewelry from tombs, although a small number has been found on mummies. The sole source of the precious gem in that period was Upper Egypt.

During the Alexandrian era the mines were worked by the Greeks, and later mining received fresh impetus under Cleopatra.

The New Kingdom was followed by a long period of stagnation. Nothing new was contributed in the field of the decorative arts, in fact if anything, activity in this sphere was reduced. The situation grew still worse in the so-called dark ages which followed. A succession of Ethiopian and Persian rulers each brought with him his own decadent style. The domination of the Ptolemies finally extinguished all the creative impulses in Egyptian art, introducing Hellenistic concepts and forms which, from an aesthetic point of view, had a disastrous effect, and Alexandria then became the center of an expanding school of Greek art. But the steady decline of the kings, the source of inspiration as well as the actual patrons of the splendid works of the past, failed to inspire works of interest.

There are some rare examples of the use of colored stones in the jewelry from the royal tombs of Ur, but these are only in ring bezels and necklaces; gem stones are occasionally found in necklaces during the oriental phase of the Etruscans. In Iran polychromy began with the use of glazed composition and inlay as in the Oxus

treasure, and then during the Hellenistic period stones and emeralds began to be used in jewelry. These were naturally not used in seals but were mounted in rings.

The taste for color in jewelry had its greatest manifestation in the lands of Southeast Asia and among the civilizations of the Indus. Large quantities of a wide variety of precious and valuable stones abound in India and in the neighboring countries of Thailand, Burma and Sri Lanka. Sculptures and paintings of men and women adorned with jewels testify to their use, as does recent work which in quality and taste points to the inheritance of a very ancient tradition. To the rich variety of stones was added the widespread use of pearls (pearl fishing has been carried on since early times in the Indian Ocean) and of enamels and vitreous pastes, which were very popular in jewelry in eastern Asia.

In Harappa, one of the most ancient centers of the Indus civilization, a belt has been found of the type which Indian women since the end of the third millennium BC have worn next to their naked bodies encircling their waist and passing between their legs. The beads which make up this belt are mainly red cornelians, green steatite, agate, jasper, amazonstone from Gujerat, jade from central Asia or Burma, lapis lazuli from Afghanistan and a sort of maiolica. The variety of this assortment gives some idea of the important place already assigned to color in ancient Asian jewelry. The proportion of colored stones to metal used in the jewelry of this huge area corresponds perhaps to the amount of minerals extracted from the alluvial deposits in the area compared to the quantity of metal. There are, in fact, far more precious stones to be found in the area than precious metals. The use of metals was therefore largely confined to the mounting of stones in various designs to display them to the best possible advantage.

The techniques of piercing, polishing and setting precious stones developed rapidly in these regions, but cutting was only accepted much later. In the east right up to modern times it has always been considered preferable to leave the stone as much as possible in its natural state.

One of the most precious gems, the ruby, is found in great quantities in the deposits and mines of southern and southeast Asia, the chief producers being Burma, Thailand and Sri Lanka. The city of Amarapura in Burma is nicknamed the City of Precious Stones. To the north, along the beds of the Irrawaddy, Chindwin and Hukong rivers, in secondary clay deposits or between calcareous dolomite marbles, are layers in which rubies, tourmalines, amber, jadeite, and other stones which occur with rubies such as sapphires and spinels, are found. Rubies, highly valued for their vivid red color, come from Mogok, north of Amarapura; those from

Gorget in the shape of a vulture, symbol of the goddess Nekhebet, from Tutankhamun's treasure (Egyptian Museum, Cairo).





above and below *One of the most precious stones, which is mostly found in southeast Asia, is the ruby.*

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Burma tend to be a more muted yellow-brown color and are less prized. They are also found in Afghanistan, Madagascar, Australia and the United States (Montana and North Carolina). It should be mentioned that in the trading of precious gems, other red stones which only resemble the ruby in color are sometimes referred to as rubies.

In the chronological order of the use of precious stones the cornelian comes first. Apart from India, the cornelian is found in central-western Asia, Arabia and Egypt, and more recently deposits have been discovered in Brazil, Siberia, Japan and Germany. Indian cornelians are never their beautiful vivid red color when they are first extracted; the color improves after they have been left a while in the sun.

Like cornelian, agate is a variety of chalcedony. Its structure consists of layers which may be opaque or translucent and are various colors. Agate is also found in India and was often used for jewelry on account of the stripes of contrasting colors. Other deposits were found in Asia Minor, Madagascar and China and today, above all, in Brazil.

Lapis lazuli has been used in Asiatic jewelry since the third millennium BC. It was also used for cylinder seals. It is a dark blue stone of varying shades of blue, indigo, light blue, turquoise and violet and is usually marked with flecks of gold caused by the presence of grains of pyrite. The oldest and most important deposits are those of Afghanistan, Russia, Persia, China and Tibet. Less precious is the lapis lazuli from the Chilean Andes and that found in Italy, in Campania and Lazio in small quantities.

The amazonstone, a recent and erroneous name for a variety of feldspar dating from a time when it was believed to come from the Rio region of the Amazon, was evidently found in antiquity in India. Its green color seems to be caused by the inclusion of oxidized copper. Today it is found in the United States, Russia, Madagascar and South Africa.

Steatite is the Greek name for soapstone, a variety of soft opaque talc with a pearly lustre which is grayish-green in color. It is a stone of little value, often used in ancient jewelry. In recent times it has been found in Germany, Bohemia, Hungary, the Tyrol, the United States and various regions of Turkestan.

After rubies, jaspers were considered to be the most precious stones in ancient times. There are many types of jasper, notably the East Indian variety which is striped and red in color, with light gray speckles. Nowadays it is quite a common stone and is found in many places such as China, the United States, Madagascar and Sicily to name but a few.

The most important deposits of nephrite or jade are in central Asia (Turkestan) and China, and during the pre-Columbian period it was also to be found in Mexico. They are not always uniform in color and vary from gray to gray-green to light grass and emerald green, and from

yellowish-brown to reddish. As an ornamental stone it has been in use from the earliest times until today.

After the Aryan invasion of India, to judge from archaeological finds, strong Achaemenean stylistic influences from Iran entered the country, followed by Greco-Buddhist and finally Muslim influences. Basically, however, external influences left no profound effects on the traditional and fundamental characteristics of eastern Asian jewelry, with its preference for an ostentatious richness of color, brilliant, intricate and detailed, aimed above all at stupefying the world rather than expressing the personality of the wearer. Indian and southeast Asian jewelry quickly rose to a remarkable level in the hands of skilled craftsmen, with resourceful and inventive techniques. Original forms, transmitted for the most part by the Sumerian and Akkadian civilizations, were fused with elements of local character which finally resulted in the fabulous appearance of Indian jewelry. Evidence from statues and wall paintings shows how widespread in the most developed areas was the passion for self-adornment with jewelry.

The gold settings of the stones were embellished with a wide use of filigree, engraving, openwork, *repoussé*, and enameling in complex ornamental forms, which contributed, along with the play of reflected light on the jewel, to its brilliance.

The Harappa culture takes its name from an important center in the Indus Valley around which it developed in the third millennium BC. This culture survived until the sixteenth century BC, and its artistic tradition survived long after because during the period of its great prosperity it had established such deep roots that, at least as far as jewelry was concerned, a lasting and lively tradition had been created.

A terracotta figure of a woman, found in Harappa, has, in addition to necklaces and bracelets, a belt very similar to one which has actually been found in excavations. It consists of six strings of cornelian beads interrupted at equal distances by an element surrounded by small spherical beads; the ends are embellished by round and triangular plates of copper, gold, steatite and maiolica which hang from them.

The beads of the necklaces, armbands, bracelets and belts which adorned the scanty clothing of the Harappa women were of a great variety of shapes and materials. A very characteristic type is a gold disc with a tube through the diameter. The discovery of similar discs at Ur and Troy indicates that there was some form of contact between various areas and that even in those ancient times journeys must have been made over long distances.

The paintings of Ajanta (fourth to fifth century AD) show men and women wearing more jewels than clothes. The size and complexity of earrings, bracelets, armbands, belts, headdresses, diadems, leg bracelets and rings, which adorn these masterpieces of pictorial art, reflect the fantastic splendor that was India.



Other valuable stones: agate, a kind of corundum (above), and jade or nephrite (below).

Indira Gandhi National
Centre for the Study of
Ancient Civilizations





Over the centuries a vast variety of designs and types have emerged, each with a specific purpose and adapted to a particular part of the body.

It was fashionable for a woman to wear not less than ten pieces of jewelry on her head besides her tiara, and these would be placed from her forehead to the nape of her neck. According to the period earrings were heavy and shaped like fishes, lotus flowers or a series of hoops, which made huge, ugly holes in the earlobe. At other times they were less bulky but still richly adorned with clusters of pearls or colored stones. Some were half-moon-shaped and minutely decorated with bezels and pendants. Necklaces were always multiple, and frequently a small, cylindrical box of highly decorated gold for holding charms would be attached to them. The necklaces began around the neck and extended to below the waist, and between the rows would hang pendants or other ornaments. There were even some which were worn over one shoulder like a bandoleer.

Women pierced the left nostril and inserted a diamond or some other stone in the skin. Sometimes a small boss of gold would be inserted in one of the incisor teeth. Even now a diamond is inserted in the skin in the center of the forehead between the eyebrows.

In antiquity diadems were sometimes like miniature monuments, with central niches into which were placed statuettes of Buddha. The composition of these headdresses, executed with meticulous use of quantities of colored elements and animal figures, became so elaborate that they developed into highly original and complex compositions.

Armlets and bracelets could be made of light metalwork or tubular hoops or jeweled bands. Some could almost stretch from the wrist to the elbow. In Bengal the women wore a complex gold ornament on the back of their hands which was attached with chains to a bracelet and finished with rings on all five fingers. A similar type of ornament was also worn on the foot.

The number and variety of belts was comparable with necklaces. They started from the groin and were made up of complex, minutely decorated rows of goldwork embellished with pearls and other stones. They had bulky, complicated clasps, pendants and jeweled garlands that extended to the thighs which, together with the calves and ankles, were adorned with multiple circlets of jewel-encrusted gold. The Hindu women of Rajasthan wore up to ten jeweled anklets, one on top of the other, each with a specific denomination. Rings were often worn on the toes.

This almost fanatical predilection for adorning the body with jewelry continued uninterrupted through the

From India: left Busto of Apsara with jeweled turban, earrings and necklaces, from the Ajanta frescoes, sixth century; above Head ornament; right Emerald, ruby and pearl necklace, eighteenth century.



centuries in India, and the craftsmen, whose inventiveness was always in great demand, developed an enormous variety of forms and achieved great heights of technical ability. Even the smallest centers were pervaded with this desire to cover the body with precious ornaments. Local goldsmiths produced an interesting type of popular jewelry which has always been connected with symbols of the Hindu religion; for instance, a traditional and very ancient amulet called nauratan, which consisted of a gold plate set with nine different precious stones. The nauratan was often used in necklaces too.

The taste for color in Greek jewelry, which gradually began to be absorbed during the Hellenistic period, included amethysts, rock crystals and plasma, as well as the stones mentioned earlier. Plasma is a type of chalcedony of various shades of green which was fairly common. Amber, known since very ancient times, was often employed in Hellenistic jewelry. Amber is not in

fact a true mineral but a fossilized resin which used to be called electrum because of its property of generating electricity when rubbed and magnetizing light objects. It varies in color from deep yellow to red, and from pale wine yellow to brown.

The art of engraving gemstones is an important technique which has lasted with varying degrees of popularity almost to the present day. Until the Hellenistic period gems were nearly always engraved in intaglio for use as seals which would imprint a relief mold on some soft material such as clay or wax. The same period saw the introduction of the engraving of gems in relief (cameo) and, thereafter, certain stones such as agate or sardonyx were chosen for their particular structure which enabled color effects of great attractiveness to be obtained, like the Augustian gem.

The skill of the Greek technique of stonecutting, for which small stones were generally used, is amazing: the scale of the work was minute and the kinds of tools



available were primitive. Before the iron age tools were of bronze or copper, and before that of stone, laboriously shaped, harder than those to be cut. What a tool lacked in efficiency was made up for by the patience of the craftsman. It is believed that a primitive form of drill was among the most ancient tools to be used for gem cutting.

Engraved stones were originally employed only as seals, their first use in jewelry being when they were set in rings, and then only those which were precious stones were regarded as jewels. Later they were also used as pendants, medallions and in bracelets and earrings. The art of engraving is particularly interesting when one considers that the figures carved complement, both in form and content, the sculpture of the various epochs. Another aspect is their importance to archaeologists in helping to date sites where they are found; for instance, the city of Ur in Mesopotamia was identified by the inscription on a cylinder seal found on the site prior to excavation.

During the Roman era this art continued to flourish and some real masterpieces were produced often, with the increasing popularity of color, for use in jewelry.

Rome during the republican period was comparable to pre-Hellenistic Greece. Little jewelry or valuable plate was made owing to laws passed to limit the amount of gold to be used. Again, as had happened in Greece, the new conquests in southern Italy, Macedonia, Greece, Asia and Africa reversed the situation, bringing a wave of prosperity and removing all restraint on wealth. The wearing of gold rings, which had been a sign of the highest distinction reserved exclusively for nobles, senators and ambassadors, was bestowed on lesser functionaries by the late third century, and towards the end of the republic rings were worn by quite ordinary people. Engraved gems became so popular that wealthy people, including Caesar himself, made collections of them.

During the imperial period, as a result of the increasing wealth flowing into Rome, the city became a center for goldsmiths' workshops, a development which could only act as an incentive for new ideas. Gradually local and provincial production acquired a homogeneity of style. In addition to gold, pearls and exotic precious stones were also coming onto the Roman markets in large numbers, and the influx resulted in an increasing use of color in Roman jewelry. There is evidence to show that the many goldsmiths and lapidaries who were attracted to Rome to supply the growing demands came from Greece and the oriental provinces. This helps to explain the predominance of Hellenistic influences in Roman jewelry until the first imperial period.

The shape of a spiral serpent, sometimes with

precious stones for the eyes, was popular for bracelets and rings. From the Etruscans the Romans took the curious form of the bulla, originally a lens-shaped pendant suspended from a broad loop and later worn as an amulet. As the Roman version of the *Etruscum aurum* (an ornament worn by the Etruscan kings), it was either decorated with filigree and adapted for use in necklaces as a pendant, or completely plain and hemispherical and attached to bracelets. An example is the bracelet found at Pompeii made of thirteen pairs of hemispheres attached to a beaded wire. The clasp is decorated with a widely used motif: the ivy leaf.

In Pompeii and Rome jewelry began to acquire Italian characteristics, but in the outlying parts of the empire it came under local influences. Thus in Taranto, Hellenistic motifs were somewhat wearily perpetuated; in Gaul, Roman products were influenced by Celtic traditions, in North Africa by Egyptian ones, and in Syria, where the Palmyra sculptures show women



left Roman cameo of Julia, daughter of Titus (Bibliothèque Nationale, Paris). The mount is of a later date. right Cameo of Augustus (British Museum, London).



Roman bracelet from Syria, fourth century. left Roman bracelet made from smooth, double hemispheres, from Pompeii, first century BC to first century AD. below Late Roman rings from the Teatro Ducale treasure, Parma.



adorned with Roman jewelry, by Iranian.

With the liberation of Roman jewelry from the Hellenistic tradition, three new techniques were developed. The first was the technique of pierced work, known as *opus interrasile*; second was the indiscriminate use of masses of colored stones with a minimum of setting or none at all; and third was the use of niello (a method of decorating engraved metals with a black compound of silver and copper). Although used occasionally in the Hellenistic period, niello does not occur in Roman jewelry before the third century when it was used in brooches and rings. All these techniques continued without interruption into the early Christian and Byzantine periods.

Opus interrasile consists of working out a design on a metal sheet, after which all the unwanted parts are removed with a chisel. It was used in bracelets, rings, parts of necklaces and the borders of medallions. A bracelet of the fourth century AD (Staatliche Museen, Berlin), found at Tartus in Syria, consists of a broad band, the outer edge of which forms a curving hexagon decorated with *opus interrasile* so minutely executed that it has the appearance of gold lace. From the same period is a ring, the bezel of which is surrounded by a wide border of openwork scrolls and tracery (Tesoro del Teatro Regio, Parma), and similar to this is the frame of a coin showing Emperor Theodosius which hangs as a pendant from a necklace now in the Museo Civico in Pavia.

Woman's ornament with a medallion of Medusa's head, from Taranto, Hellenistic, fourth to third century BC.

In Roman jewelry stones are often set in a broad frame indented with parallel grooves. They were usually cut oval or square with convex, simply polished surfaces. More unusual are the almond, round, cylindrical or prismatic-shaped stones. Frequently stones are mounted without a setting and are secured by a hinge threaded through them. Even pearls are mounted in this way. In a necklace made from garnets from a tomb at Montemesola (Museo Nazionale, Taranto), the stones are threaded on a gold wire which forms an eye on either side of the stone.

The violet of the amethyst, the green of the emerald and plasma, the lustre of the pearl and the yellow of gold, often grouped together in one jewel to create a spectacular chromatic effect, were to become the typical colors used in Roman jewelry when it developed its own characteristic style after about the second century BC. New symbols such as the wheel, the half-moon, ivy and laurel leaves were discreetly used in necklaces, bracelets and pendants. The use of plain or framed coins as pendants was introduced and became popular; pins were decorated in the same way. The ever-growing taste for color led to the use of a wider variety of precious stones. Blue or pink topaz was considered more precious than yellow. It is very likely that the Indian carbuncle which Pliny mentions was the ruby which is among the most rare and precious gems. Like many other gems, most rubies came from the east, notably from Burma, Thailand and Sri Lanka.

Amulets were believed to give protection from misfortunes and danger and to be good auguries, while possession of a talisman was thought to endow positive magic powers (Aladdin's lamp, Aaron's rod, etc.). The goldsmiths included them in their work and they frequently appear in jewelry. The most ancient talismans are the ax, the arrow head and the swastika. In hieroglyphics the ax means a god or leader; the arrow head has a similar meaning, while the word swastika in Sanskrit means happiness, good luck and well-being.

In ancient Egypt boomerang-shaped ivory amulets engraved with magic words and symbols gave way to the widespread use of the scarab, which represented Ptah, creator of the universe, and was linked to the cult. It was also the symbol of the future and an important part of the death rites; during embalming a stone scarab bearing magic formulae would be laid in the corpse in place of the heart for the propitiation of Osiris. From the eighteenth dynasty the flat part of the scarab was engraved with words to bring good luck. From the beginning of the nineteenth century BC scarabs bore the names of the kings and have, therefore, been very important in the study of the chronology of the pharaohs. The scarab was imitated by the Greeks, the



Phoenicians and the Etruscans until the fourth century BC.

Phoenicians and the Etruscans until the fourth century BC.

The serpent was the symbol of eternity and talisman of long life, good health and vitality. It was also very popular with the Aztecs as a symbol of the sun and of time everlasting. In Egypt the serpent Uraeus was a sign of royalty, power and energy.

Another important Egyptian symbol used on amulets was the eye of Horus, the first born god, whose symbol was the falcon. These were usually made of enameled terracotta or similar material, but in some exceptional cases enameled gold was used.

In addition to these important symbols, Egyptian craftsmen used a rich variety of other shapes for amulets: isis knots, crosses, feathers, animals, insects and parts of the human body. In Greece and Rome amulets were made in the shapes of griffons, sirens, gorgons' heads, phallic symbols, satyrs and so on.

The sphinx was attributed with magical powers. In Egypt it had a lion's body and a king's head, while in Greece and elsewhere it had a woman's head.

As Christianity spread throughout the world despite great opposition and persecution, paganism was gradually abandoned, although belief in magic and many superstitions persisted for a long time. Often aspects of the supernatural, the prediction of the future and magical practices were incorporated into Christianity.

During the high Middle Ages magic symbols lost prestige, but, with the rediscovery of magic texts and



Greek and Arabic astrology, occult practices again flourished in the later Middle Ages and in the Renaissance, becoming subjects for study even for famous scholars and writers. The statutes of the hospital of Troyes, in France, of 1263 declare that no nun may wear rings or precious stones except in case of illness. Precious stones were thought to prevent contagion. In an inventory of Charles V of France a stone is mentioned called the Holy Stone which helped any woman wearing it to have children; another had the power to cure gout, which used to be a very common ailment.

Medieval magic was closely linked with alchemy, which was more concerned with natural phenomena and considered to be a science or a higher form of knowledge. The word, which is of Arabic origin and refers to the philosopher's stone, is the name given to the still undiscovered process which would transform base metals into gold. The practice of alchemy, which is the precursor of modern chemistry, began in Hellenistic Egypt in the first century AD and reached its peak in the fifteenth and sixteenth centuries.

Fine and precious stones, apart from being prized for their beauty and value in ancient times, were also thought to have the power of protecting men from poison or of curing illnesses if touched or even swallowed; these are beliefs which have persisted right up to relatively recent times. Writing in his *Septenaire Chronology* on the death of Philip II in 1598, Palma Cayet says: "Two days before his death the doctors gave him a beverage containing dregs of precious stones [zircon], and when he took it he said that his mother, the empress,

had drunk a similar concoction a year before her death."

Diamonds were thought to make one merry, prevent fear of darkness, guarantee marital happiness and neutralize bad spells and contagion from the worst diseases. In heraldry they were the symbols of power, constancy and loyalty.

The emerald, according to various old beliefs, speeded up or held back childbirth if tied to the thigh or placed on the womb of a pregnant woman; it was believed to be a good antidote for any illness caused by poison. According to some it was a symbol of chastity and shattered at the moment of contact between a man and a woman, but according to others it was an aphrodisiac. It is well disposed towards those people born under the sign of Cancer.

Among the many virtues attributed to the ruby, possession of it was thought to make men good, to prevent effervescence in water, to help in acquiring lands and titles, to soothe temper and protect from seduction; but its powers were rendered negative if it was worn on the right-hand side. It is the favored stone for those born under the sign of Capricorn.

The sapphire, a stone much prized by the ancients, was thought to be protection from scorpion bites and to cure internal sores if held in the mouth. It was also thought to be an aid to those who took a vow of chastity, to ward off the evil eye, to cure dysentery and to have the power to arrest a hemorrhage. This stone and the turquoise favor the sign of Taurus.

The aquamarine was thought to ensure happy marriage, to be the best remedy for liver complaints or

below and left Roman earrings: pearl clusters and gold hemispheres studded with garnets or emeralds from the house of Menander, Pompeii, first century BC. right Charlemagne's talisman (Cathedral Treasury, Rheims).



toothache, and taken in a pulverized form was believed to cure sore eyes. The sign of the zodiac in this case is Scorpio.

The zircon was held to be a symbol of prudence and sentiment, the red one being an expression of fury and the violet one of great elevation of mind. It was deadly for those born under Taurus and Scorpio.

In the Middle Ages it was believed that a mixture of powdered quartz and honey was the best thing for stimulating lactation in wet nurses. Other varieties of quartz were thought to preserve one from drunkenness.

As correct adornment for the Jewish high priest, Moses prescribed an ornament containing twelve stones which symbolized the twelve attributes of God; seven of these were varieties of quartz stones: sardonyx (king), topaz (benefactor), jasper (the living God), cornelian (omnipotent God), agate (strength), amethyst (spirit) and onyx (Lord).

Rock crystal was the symbol of virginity, innocence and chastity; the amethyst had the power to protect the fields from tempests and locusts and to ward off evil spirits. Jasper stopped hemorrhages in wounded people and appeased faithless love. Topaz relieved melancholy and quenched thirst if held in the mouth. Agate inspired eloquence. Turquoise warded off the damnation of the fallen, and heliotrope prolonged life. Carbuncle, a name for red stones, made men gallant. Onyx ensured health of body and spirit, and together with coral cured epilepsy. Many stones, for example opal, were believed in antiquity to provide protection against poisoned food, and, since the practice of

poisoning one's enemies was so widespread, it was considered essential to always carry some such stone. Thus men deceived themselves that they were protected from death.

One of the most famous talisman jewels belonged to Charlemagne. It consists of two enormous oval sapphires, mounted back to back with a piece of wood from the True Cross between them, in a richly set round frame shaped like a pilgrim's flask. The neck of the flask, a rectangular shape, possibly contained relics and was flanked on either side by the figures of two kneeling women supporting it with their hands. The bezel is surrounded with pearls and richly embellished with filigree volutes. The rest of the frame is studded with ten square and oval semiprecious stones and pearls, and the rectangular neck is set with a rhomboid gem. To judge from its stylistic characteristics, it is possible that the jewel was made in Asia Minor and that the two little female figures were added later.

The talisman was buried with the emperor in AD 814 at Aachen, exhumed by Otto III in 1000 and conserved in the cathedral treasury. In 1804 the canons presented it to the Empress Josephine to wear at her coronation ceremony. It later passed to Napoleon III, whose widow presented it to the archbishop of Rheims before she died in 1920, as a contribution to the cathedral for the damage suffered from bombing during the First World War.



Byzantine and Barbaric traditions in the Middle Ages based on the workshops of the west

In Europe the use of color in jewelry, introduced in the Hellenistic epoch, gradually increased until by the Roman era the taste for using colored stones and enamels was so widespread that the work of the metalworkers was overshadowed. In some jewelry gold was used merely as a setting for the precious stones or for enameled surfaces. In fact the Roman period saw the beginning of a decline in the art of the great master jewelers of Asia, Egypt and Greece, not only from the point of view of style, but of creativity. Indeed by the late Roman period the wide use of coins in jewelry, which was to continue in the early Byzantine era, indicates an attempt to speed up the manufacture of necklaces and bracelets.

The desire of the Byzantine court to maintain the hegemony of the Roman empire in the field of the arts soon had to give way to the passage of time. It evolved a style more nearly related to the Near East, just as in religious affairs it acquired a new spirit which reflected its own characteristic appearance and development. Jewelry became essentially ornate in appearance and composition and the techniques most used were filigree and enameling, in addition to the copious application of precious stones and pearls. Among the Roman traditions passed on to the new Byzantine workshops was a heritage of various forms of jewelry, the techniques of pierced work and the use of coins.

Two bracelets of the sixth century in the Archaeological Museum in Istanbul are smooth tubular hoops with the decoration concentrated at the terminals. Their form clearly derives from Iranian styles, but the decoration of an ornamental geometric design worked in granulation is distinctly Byzantine in character. In the same museum are some earrings of the sixth to seventh century which demonstrate two different styles. The earliest part consists of a ring-shaped hook from which hang two successive clusters of stones. The first cluster is a ring of six stones around a center gem. The second cluster, which is suspended from the first, is a square with a large center stone, surrounded by eight smaller and one very small stone in each corner. All the settings are embellished with granulation. Three larger stones are attached to the lower side of the square, also copiously embellished with granulation, and from them hang five small pendants, each consisting of a rock crystal with two pearls on each side.

The Byzantine empress, Theodora. A splendid diadem, necklaces, earrings and brooches adorn the figure of Justinian's wife in this detail from the sixth-century mosaics at San Vitale, Ravenna. From the Roman to the Byzantine period a style evolved which was more nearly related to the Near East.



Byzantine necklace with a medallion of Emperor Tiberius II (Flavius Constantinus Tiberius), sixth century, and earrings of pearls, rubies and turquoises, seventh to ninth century. right Earring of gold, pearls and stones, Byzantine, third century.

To this type of design, which is reminiscent of a Roman insignia, can be added another which, although derived in composition from the late Roman style, has a very marked oriental influence. It lacks full surfaces and the whole structure is in filigree encrusted with pearls and colored stones. This example superseded the Roman stylistic concept, expressing itself in its own style of which filigree plays the most important part. In addition half-moon-shaped earrings became very popular, and remained so for a very long time.

The use of medallions as pendants was widespread. Many are decorated with filigree tracery, openwork or enamel on a gold background, often completed with stones or pearls in bezel or coronet settings. Others are square and bordered with mock granulation.

An oval medallion from Aosta cathedral treasury is a tribute to the enduring qualities of the distinctive stylistic character of Byzantine jewelry. It is in fact a reframed Roman agate cameo showing the bust of a goddess in profile. The frame consists of three bands of

filigree scrolls differently arranged in concentric patterns. In the first the scrolls are embellished with little cabochon gems and in the third with pearls.

Court jewels (as depicted in the mosaics of Ravenna) must have been of staggering magnificence. The mosaics in San Vitale, Ravenna, clearly show the jewelry worn by Justinian and Theodora and members of their court. The fibula which fastened the emperor's cloak is a huge flower made of gems with long pearl pendants. The empress wears, in addition to a valuable crown, a headdress and earrings with innumerable precious pendants. Some of the court ladies are adorned with jewels, earrings, bracelets and rings which, though they were functional, give clear evidence of a splendid world appropriate to the enormous power of these people. Plain fabrics are embellished with gold, precious stones and pearls, while the famous and valuable embroideries were sufficiently ornate on their own and would be left free of jewels.

Necklaces might be made entirely of pearls or rows of variously shaped precious and semiprecious stones interspersed with plaited gold chains or gold elements such as beads, cylinders or little medallions. Necklaces made of vitreous paste beads in various shapes and sizes, often alternated with gold coins bearing the emperor's head, were very popular and were produced in the Venetian and Syrian workshops.

The spiritual concepts of Byzantine art established a new aesthetic order throughout the Christian world, and its vast sphere of influence, extending from the Balkan peninsula and Russia to parts of Italy and Egypt, endured for a length of time unrivaled by any other preceding stylistic period. The goldsmith's work was of prime importance, and Constantinople was the first place where a method of marking silver was used which makes it possible to date the pieces. Although culture was widely diffused, most of the workshops and the best goldsmiths were certainly in the capital, the enormously wealthy center of commerce between east and west.

The conquest and sacking of Constantinople in 1204 during the crusades effectively put an end to its artistic activity. Goldware and jewelry suffered terrible and irreparable damage at this time for obvious reasons.

While new and individual forms of expression were evolving and developing in the Byzantine world, powerful groups of people were exerting their influence further west during and following the dissolution of the Roman empire. These were the northern tribes who between the fourth and eighth centuries were actively expanding by invading large parts of southern Europe from the Danube to Spain and, above all, the Italian peninsula. The most significant remains left by these people are the metal objects in which they excelled. The enormous quantity of finds in the various areas constitutes a broader basis for study than the scanty written records. Nevertheless, it is difficult to coordinate because of the vastness of the area in question and the





Seven gold coins bordered with filigree beads, (one stamped with Anastasius I, five with Justinian I, and one with Tiberius II (Flavius Constantinus Tiberius), decorate this necklace of faience beads and oblongs from Castel Trosino, seventh century (Museo dell' Alto Medioevo, Rome). right Brooch of gold, silver and enamel from Wittislingen, on the Danube, seventh century.





frequent displacement of the various ethnic groups, which comprised Ostrogoths, Visigoths, Franks, Burgundians, Anglo-Saxons, Germans and Lombards. Although the works of these tribes, who were closely related to each other, are referred to collectively as barbarian art, many technical and stylistic differences are discernible. Oriental and Celtic influences are also mixed with the local characteristics of the various regions.

The greatest examples of barbarian art were made between the fifth and seventh centuries and are clearly distinctive. At Petroasa in Rumania an enormous bird-shaped brooch was found, dating back to before the Byzantine cultural influence. Its naturalistic qualities are reminiscent of late Roman art, yet its symbology and color (most of which has disappeared) points to a deeper expression of a new style. The same shape was repeated later in Spain and elsewhere but these were flat versions, with elementary ornamentation of stones and vitreous paste in *cloisonné*.

From the isolated example of Petroasa, which though lacking in executive refinement is full of expression, a gap of about a century elapses before one passes to an important find made in Scandinavia. These are two multitubular necklaces which were unearthed on the two neighboring islands of Gotland and Öland to the southeast of Sweden. These two islands have been the sites of the richest excavations of goldwork and jewelry in the whole of Scandinavia, and certainly they were once two of the major centers of commercial import and

export between Scandinavia and the rest of Europe. The great commercial ties these people had with faraway countries are shown by the fact that more than a hundred thousand coins (mostly silver and of Arabian and eastern origin) have been excavated together with a few central and western European coins.

Besides the treasures found in Gotland and Öland a few pieces have been discovered at the disembarkation points on the mainland. This indicates that people probably hid their most precious belongings underground before departing on a long voyage, intending to recover them when they returned. The large number of finds shows that not very many people did return as in those days ruthless pirates roamed the seas.

The two gold necklaces mentioned above are a refined version of torques. The one found at Gotland consists of three tubular elements, one above the other, which widen towards the bottom. The second necklace is the same as the first except it has seven elements. The clasp consists of a hinge at the back and teeth at the front which run in line with each tube and fit into the hollow part of the corresponding tubes. The tubes are alternated at regular intervals with protruding semicircles in three's or one's, and these are embellished with moldings and decorations in filigree granules. On either side of the semicircles or rings, the tube is encased in filigree tracery and granulation while the central space is occupied by scrolls and serpentine motifs.

On the first necklace fantastic animal and dragon

left *Anglo-Saxon shoulder brooch in enamel, from Sutton Hoo ship burial, (seventh century).*

figures have been worked with filigree granules, and human heads in relief with protruding cheekbones, large eyes and open mouths occupy the spaces between the tubes. This highly ornate gold decoration can only be compared with the most extravagant Etruscan fibula. Considering that from a stylistic viewpoint this find was quite unique, one wonders where the jewel was produced or where the goldsmith who made it came from. This question arises from the fact that in the Scandinavian regions where excavations have been made a great variety of different styles of jewelry and goldwork have been found ranging from arabesque and late Roman designs to Celtic moldings and the mounting

of colored stones.

The most masterly examples of the use of polychromy were found in 1939 in the ship burial of Sutton Hoo, England. During excavation work prior to the building of the Ipswich Museum, Suffolk, east of the river Deben, a complete funeral ship containing the richest treasure ever found in England was discovered in a barrow. There were no human remains, and it is thought that the ship was a cenotaph or memorial to a seventh-century East Anglian king. The splendid jewels which constitute the treasure are rare examples of the skill of the Anglo-Saxon goldsmiths, particularly in the art of enameling. This can be seen in the huge shoulder pin composed of two hinged elements, with curved smooth surfaces decorated with *cloisonné* enamel geometric chessboard designs bordered with a tracery of zoomorphic shapes, and with molded ends. A unique piece is an ivory purse,



Gold collar from Färjestaden, Öland (maximum diameter 9 ins), and overleaf detail of another collar from Alleborg, Västergötland, both sixth century (National Museum of Antiquities, Stockholm).



with enameled gold plaques decorated with human zoomorphic and ornamental motifs, executed with the greatest virtuosity, refinement and aesthetic taste. The style which is Celtic in derivation relates to Irish manuscript painting.

Apart from the colorful jeweled pieces there are some other gold objects, such as a triangular fibula which has three gold hemispheres covered with a finely worked tracery of niello. The treasure, which also includes thirty-seven gold coins, extremely valuable in assessing the date, can now be seen in the British Museum.

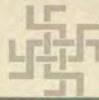
The three finds of Petroasa, the Scandinavian islands and Sutton Hoo constitute, in my opinion, the most significant examples of jewelry in Europe between the fifth and the seventh centuries. However, there are also other high quality jewels of this period such as the collection at the Museo dell'Alto Medioevo in Rome, which came from Castel Trosino, and the fibula which came from Wittislingen on the river Danube, and is now kept in the Nationalmuseum in Munich.

There is not a very great variety of jewelry from the barbaric period. There are a few earrings, rings and necklaces, many of which are of the torque design, and the rest consists of fibulae whose shape and decoration

reveal the goldsmiths' boundless imagination, especially those of southern Europe.

The Carolingian and Ottonian periods witnessed a great expansion in the production of religious objects in the abbey and court workshops of Germany. Numerous crosses, reliquaries, monstrances, gospel covers, complete altars and scepters, crowns and other royal insignia were made by skilled goldsmiths. The application of jewelry techniques is discernible in the use of refined filigree work and precious stones in crosses, shrines and gospel covers. As a result of the spread of Christianity one observes, in addition to traces of Byzantine influences above all in the enameling, a return to the major forms of classical Rome.

Christian burial rites, by then in general use, put an end to the tradition of burying the dead with all their wealth and jewels. From the beginning of the eighth century, therefore, the most interesting products of goldware which have come down to us are almost exclusively important pieces which were preserved in cathedral, abbey or royal treasuries. Jewels surviving from the end of the first millennium are very rare, since funeral ornaments so widespread in the past are completely lacking. The scant written information being also of a religious nature includes little about jewelry.





Gold belt buckle, Anglo-Saxon, seventh century, from the Sutton Hoo ship burial, found east of the river Deben, Suffolk, England (British Museum, London). below Cloak brooch, Swedish, thirteenth century.



Merovingian buckle from Tressan (Saint-Germain-en-Laye, Museum). left Gold pectoral in repoussé and engraved, German, twelfth century (Victoria and Albert Museum, London).





A very important find amongst the few secular survivals from this period are the rings of Ethelwulf, king of Wessex (839-58), and Ethelswith, queen of Mercia (855-89), found at Laverstock, England, in 1870 and preserved in the British Museum. The two rings are worked in niello. The king's ring is in the form of a bishop's mitre, with his name engraved around the brim, flanked by two Greek crosses. The upper part is decorated with a design of two swans facing each other across a central triangular motif surmounted by a rose, from which a vertical stem ends in a second flower. The workmanship is not particularly refined and foreshadows the almost unpleasant Romanesque modes. The central ornament of the queen's ring is a hemisphere shape bordered by seed pearls. The disc is decorated with a fantastic animal, a chimaera within a four-lobed circle. The various spaces in between are filled with

simple ornamentation.

Layman's jewelry during the Romanesque period was very scarce. With rare exceptions the services of goldsmiths were completely monopolized by the Church, although occasionally the workshops would produce civil jewelry. There is an eleventh-century account of certain shops on the Grand-Pont in Paris where necklaces, pins and clasps were made *à l'usage des barons et des nobles dames*.

The pieces of this period tend to be a mixture of barbaric, Byzantine and classical stylistic elements, which are often clumsily worked. As in architecture, in which elements derived from Roman buildings were incorporated, so in jewelry gems engraved in the old way were often used, and it is not uncommon to find a bishop's ring set with a gem engraved with a pagan subject, in strong contrast to Catholic principles.

Left Brooch, *Anglo-Saxon (?)*, mid fifth century.
 above right *Londesborough brooch*, Irish, eighth century.
 below right *Castellani brooch from Canosa*, seventh or eighth century, with strong Byzantine connotations (British Museum, London).

Enamel, filigree pearls and irregularly shaped polished precious stones continued to be the dominant decorative elements, while the composition alternates between severe simplicity and costly richness.

Pictures and sculptures of this period give scant illustration of jewelry. One of the few exceptions is found in two stucco figures of saints in the tempietto of Santa Maria in Valle, at Cividale del Friuli. The young women, dressed in Byzantine fashion, wear crowns which seem to be decorated with pearls; their necklaces consist of several elements which together make a broad band. Their robes are richly bordered with pearls and precious stones sewn on in a lozenge arrangement composed into stylized flowers or geometric patterns.

The best Italian workshops were in Venice, Milan and Palermo. The Norman court in Sicily favored the decoration of ceremonial costumes of kings and other dignitaries with splendid jewels, for which skilled oriental craftsmen were employed. The cuffs and hems of the silk robes of Roger II and William II were sumptuously embroidered with pearls, gold thread, gems and enamel. These fabulous robes can be seen today in the Schatzkammer at the Kunsthistorisches Museum in Vienna. There are also Frederick II's gloves made of precious woven silk encrusted with little pearls, pieces of finely enameled gold and gems.

The *tiraz* or Palerman workshop with its Muslim, Greek and local craftsmen, produced exquisite works for the court, the styles of which consisted of a mixture of local characteristics, superimposed on basic Byzantine models, attaining a quality and technical perfection which place them amongst the greatest European achievements of the period. The crown, which belonged to Queen Constance of Aragon, who married Frederick II in 1209, is preserved in the cathedral treasury of Palermo. This precious royal ceremonial headdress clearly shows mixed Byzantine and oriental influences in the style of its composition. It is in the shape of a skullcap of heavy woven gold. Rising from the band which encircles the lower part of the cap are two arches which cross each other creating four divisions. Gold four-lobed motifs decorated with enamel from which protrude coronet-set cabochon gems, with a large pearl between each, are the chief recurring pattern on the arches and the band. The remaining spaces between the motifs are filled with pieces of molded and enameled gold, while the edges of the two arches, the band and every patterned piece on them are emphasized by being outlined by a double row of seed pearls. Spaced out along the edge of the cap are sixteen finely punched gold stylized lilies in the oriental manner, each with a little







Star-shaped brooch set with pearls and precious stones, northern Italy, c. mid fourteenth century. left crown-cap of Queen Constance of Aragon, late twelfth century (Cathedral Treasury, Palermo).

turquoise in the center. The four spaces between the arches each contain seven gems, a central one surrounded by three small and large ones alternately set. On top of the cap where the two arches cross each other is an oval stone surrounded by pearls. Two long gold pendants, finely decorated in enamel, hang from superimposed rings on each side of the crown. They consist of a triangular network of links horizontally crossed by three crescent-shaped and three rhomboid bars alternately; from the base of each triangle hang three gold pendants, a drop-shaped one with a spherical one on each side.

Rings were widely worn and were increasingly

attributed with religious or superstitious value; they were used for ceremonial purposes and, as always, as seals. It was around this time that the ring given as a promise of marriage became known as a betrothal ring. Signs of the zodiac were used for decoration of mounted gems where the quality of execution and imagination, although nothing exceptional, was ennobled by engraving and niello techniques. Usually the bezel was prominent, often conical, the surface being connected with the curved surface of the ring, with a small gem dominating the top of the cone. Other bezels with larger gems were in the shape of inverted cones, as were the stone's supports.



Among people of high rank brooches were the most frequently used ornament after rings. They were usually round, often with protruding cone-shaped surfaces decorated with concentric patterns; others were set with cabochon stones on prominent bezels. A popular motif was an eagle inside a decorated circle in pierced work embellished with enamel. Other motifs used were stars and stylized flowers, encrusted with gems, pearls and filigree. Often an old cameo was reset in a rich filigree frame with precious stones.

The mosaics, paintings and sculptures of the period show that necklaces and bracelets were substituted with pearls, gold threads and precious stones which adorned necklines and sleeves. Even the lower hem of the most extravagant clothes and footwear were decorated in the richest and most varied ways.

Jewelry in Europe at the beginning of the eleventh century underwent a gradual blending of various artistic currents. In some places strong Byzantine characteristics were integrated with classical elements and lacked vitality, while in others the old barbarian style was taken as a foundation and became refined and in some aspects elevated. This uncertainty of direction was gradually crystallized by the reawakening of the long dormant interest of the educated layman in learning and the arts encouraged by new conditions of prosperity. This resurgence gradually affected the whole of the western world and prepared the way for the wonderful flowering of the Renaissance.

The new prosperity inevitably led to an increased demand for jewelry in Europe, and soon the jewelers began to liberate themselves from the patronage of the Church to serve the numerous courts and other rich masters. In the largest centers they organized themselves into guilds, and the growth of the guild system brought the craft to a high degree of technical achievement. A rigorous apprenticeship and high standards of workmanship were insisted upon, and, to avoid deception, it was laid down that the alloys used in goldware and jewelry should be richer than those used for gold and silver coins. Various rules prohibited the mounting of freshwater pearls together with sea pearls in the same piece of jewelry, the imitation of gems by using vitreous pastes or the backing of precious and semiprecious stones with foils in order to enhance their brightness. Guilds became very powerful in some countries, and their attempts to organize these laws of prohibition often brought them into conflict with other local authorities.

We have noted that between the barbarian and Romanesque periods jewelry underwent great stylistic changes, we have also seen that during the Romanesque

period little jewelry was produced. The beginning of the Gothic era appears to have seen such an increase in jewelry production that by the fourteenth century it was considered necessary in England and Spain to pass new laws regulating, according to social standing, the quality and quantity of jewelry which citizens might wear.

While in the Romanesque period pictures or sculptures rarely reveal any information on contemporary jewelry, with the beginning of the Gothic era jewelry appears again; even religious pictures reflected worldly fashions, and as time went on jewelry appeared increasingly. Some angels painted by Duccio di Buoninsegna (reportedly from ?1278–?1319) wear gold fillets around their heads with, in the center, a gold disc set with a gem, surrounded by little pearls. Other saints in Duccio's *Maestà* wear even more elaborate diadems. In a polyptych Simone Martini (about 1285–1344) in the Museo Nazionale, Pisa, St. Agnes is wearing a diadem embellished with a lily, bordered by rows of pearls. In the center of the rich upper hem of the saint's tunic is a round clasp with a large central gem surrounded by eight enormous pearls. In the same altarpiece St. Catherine's veil is held in place by a crown consisting of a fine band decorated with precious stones in lozenge and oval shapes bordered by pearls.

These were certainly not figments of the artist's imagination but must have been the type of jewel which he saw adorning the rich Siennese ladies. Nor are they isolated examples. In Pietro Lorenzetti's altarpiece (first half of the fourteenth century) for San Pietro a Ovale, Siena, a large round decorated clasp fastens the Madonna's mantle on her breast, while Ambrogio Lorenzetti adorns the figure of Justice, in the Palazzo Pubblico, Siena, with a large diadem and with precious stones and pearls along the hems of her robes. These were undoubtedly fashionable in that period.

One of the most frequently worn precious ornaments at this time was the brooch, which was used both functionally or purely ornamentally. The most common were round, star-shaped, pentagonal and, more rarely, lozenge-shaped. There were also ring brooches which were usually smaller and were also round, pentagonal, lobed, star, wheel or heart-shaped, or in the form of a monogram.

The decoration of the first type was largely arrangements of gems and pearls on a gold base often embellished with filigree. The bezels were often raised and encrusted with filigree, with claws to hold the stones in place.

A most beautiful lozenge-shaped clasp is the Fleur-de-Lys Brooch, among the French crown jewels conserved in the Louvre, Paris. On a background of blue enamel, patterned all over with stylized fleurs-de-lys is a large gold lily set with precious and semiprecious stones of various sizes and shapes. The brooch is framed by a band set with thirty-two stones. This example, like so many others, shows how little progress had been made in stone

The medieval goldsmith in his workshop: St. Eligius, goldsmith and protector of goldsmiths, from a painting by Taddeo Gaddi (Prado, Madrid).



English fourteenth-century brooch (British Museum, London). above French thirteenth- or fourteenth-century brooch (Victoria and Albert Museum, London). right The so-called Founder's Jewel bequeathed to New College, Oxford, by William of Wykeham in 1404.

cutting during the preceding period.

More refined results were obtained in ring brooches, which continued to be popular in the following century. The gold ring might be worked in *repoussé* with stylized animals, foliage or tracery and was often set with small precious stones which heightened the colorful effect. Little inscriptions were engraved behind these decorations or, more rarely, in front of them, and the Gothic lettering made them highly ornamental. The inscriptions could be of a religious, friendly or amorous nature, appropriate to the chivalrous spirit of the age.

Monogram brooches found more frequently in the northern countries are very ingenious. In a splendid



example called the Founder's Jewel, bequeathed in 1404 to New College, Oxford, by its founder William of Wykeham, the two spaces formed by the arches of the letter *M* have been made into two Gothic niches framed with pierced work. On the left is the figure of the Angel of the Annunciation, and on the right is the Madonna exquisitely modeled and enameled. There is a vase on the middle stroke of the letter with three lilies, and above them are three pearls set in a triangular shape. The letter is surmounted by a crown composed of three lilies interspersed with two pearls; the two outer strokes of the letter are each set with three gems. This piece is a very important example of the development of style, for it is among the first medieval objects to show an affinity with the ideas being expressed in contemporary figurative art. As in Hellenistic Greece the collaboration between artist and goldsmith was to give rise to impressive results.

Another increasingly popular jewel in the Gothic period was the ring. Examples frequently had a polygon-shaped hoop instead of a round one, a prominent bezel and inscriptions worked in niello on the outside or inside. If it was not inscribed or decorated, the outside of the hoop might be molded with a flower-shaped bezel, the petals being covered with tiny pearls and a half pearl in the center. On some there were two heraldic lions modeled in full relief, one paw on top of the other, or fantastic animals in similar poses, flanking the bezel, as on the ring of John the Fearless in the Louvre, with its bezel in high relief flanked by two dragons arising out of fleurs-de-lys crowns. Finally, the classical type, with an oval or round bezel containing an engraved gem persisted.



The central part of a diadem in the British Museum displays noticeable similarities to those painted by Simone Martini. It consists of a band bordered with pearls, and a raised central element in a shape somewhat like a shamrock. The base of the support is a tracery of gold wires; the middle of the band is set with irregularly shaped stones; other stones and a central pearl adorn the raised element.

Necklaces were infrequently used at this time. There are records of some in ancient inventories and anyway this was an ornament which had no special characteristics; instead, the fashion for adorning the neckline and sleeves of robes with precious stones was continued.

Around 1340 it became the fashion to enrich belts with elegantly elaborate buckles and with linked gold elements decorated with enamel. A beautiful Italian example in London's Victoria and Albert Museum shows the great skill and plastic decorative quality of high Gothic. The two sections of the buckle are covered with a rich, skillfully engraved tracery of branches and leaves, which form a background. The ring which holds the two fastening pins is two-lobed and bordered with a double plait.

The buckle of a belt discovered in 1881 at Dune in the parish of Dalhem-sur-Gotland is a masterpiece of its kind (Historiska Museet, Stockholm). It dates from about 1340 and is carved with a scene depicting a man, attended by a page, riding towards a lady. The ring has an openwork scene showing a seated man with another man kneeling before him surrounded by branches and bunches of grapes. In this beautiful example of Rhenish art, the plastic conception is of high artistic quality and must have been the work of a highly gifted sculptor.



Ring of John the Fearless, duke of Burgundy, early fifteenth century (Louvre, Paris). left The Fleur-de-Lys Brooch in gold and precious stones, fourteenth century (Louvre, Paris). top English fourteenth-century ring (Museo Poldi Pezzoli, Milan).

Valuable belts were very fashionable at this time and this is documented by the mosaics of about 1270 in the basilica of St. Mark, Venice. Women can be seen wearing belts of alternate red and gold pieces, buckled at the waist, with one of the ends falling halfway down the leg.

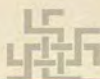
An unusual jewel from the second half of the fourteenth century is the oval medallion known as the Onyx of Schaffhausen (Musée de Tous-les-Saints). This is a Roman cameo engraved with an image of Fortune in a jeweled frame. It consists of very close-set bezels containing precious stones and pearls. The stones, as in other jewels of the period, are only polished and set in their natural shapes which gives a very rich effect.

Not all Gothic jewelry can be obviously compared with the architectural forms, but its design tended to use the pointed arch shape (rather than the Romanesque round arch), and vertical lines draw the eye from the bottom to the top where the arch would often be many lobed. In the northern countries and in Spain this style endured for much longer, while in Italy new ideas and concepts were evolving.

A valuable pendant in the shape of an ivy leaf which opens (Museo Civico, Cividale del Friuli) is decorated with enamels of outstanding fineness. The entire surface of the outside is covered with branches, which follow the line of the veins in the ivy leaf; various birds in lively poses perch on the branches and the side of the pendant is decorated with volutes, flowers and leaves. The back is covered with a chessboard pattern of red and blue rhombuses, containing two heraldic devices: two pairs of lilies divided by a bar on the blue background and a two-headed eagle on the red one. The workmanship is mid fourteenth-century French and is probably by a court artist, who was clearly influenced by the miniatures of Jean Pucelle, in the *Books of the Small Hours* (today in the Cloisters, Metropolitan Museum, New York). How it would have been used is not clear, since the rings on each side do not seem to be suitable for suspending it.



Detail of a fifteenth-century Italian belt (Victoria and Albert Museum, London). below. Silver buckle, Rhineland, c. 1340 (Historiska Museet, Stockholm). right French pendant (?) in inlaid gold and enamel, mid fifteenth century (Museo Civico, Cividale del Friuli).







Art and jewelry : discussion on the styles from the Renaissance to neoclassicism

Many factors, political, economic, religious, social and cultural, which had already been manifesting themselves since the thirteenth century, prepared the way in Italy for the artistic and cultural ideas of the Renaissance whose naturalistic and scientific conception, which was also based on the sensitivity and study of the classic works, can be defined as remarkably modern.

Humanism began to invade the field of politics, opposing clericalism, and the power of the Church as an institution began to shrink. Gradually beginning to develop was a middle or bourgeois class which was patriotic, ambitious and desirous of prestige. More rational attitudes towards the social order evolved, and the process of economic development led to the improvement of transport and of technical and commercial organization. Free enterprise was sanctioned, and in Italy the first banking organizations in Europe were founded. The feudal system disintegrated, and a new order based on wealth arose in its place.

In the field of art the revival of interest in the antique gave rise to new aesthetic standards. During the Gothic era naturalism had partially manifested itself, in the sense that attention was paid to detail, but this had been entirely to the detriment of the vision as a whole. The new tendency, however, was to see the work, no matter how complex in detail, as a fundamental element in an ordered and rational world and as an individual whole.

The decorative arts, including jewelry and goldwork, were greatly influenced by these concepts. The desire of princes and despots to show their wealth and power led to a great demand for jewelry and, therefore, a great increase in its production. Some experience in this art came to be regarded as an essential apprenticeship for young men who wished to become artists. Two young goldsmiths, Ghiberti and Brunelleschi, submitted designs for the competition in 1401 for a new baptistry door in Florence. More than a century later Hans Holbein the Younger designed jewels for the English court. Young artists such as Antonio Pollaiuolo, Francesco Francia, Maso Finiguerra, Caradosso, Ghirlandaio, Michelozzo, Verrocchio and Lorenzo di Credi worked as jewelers making pendants and *enseigne* (disc-shaped hat ornaments worn by men). These works are never signed and the subjects range from portraits to themes of classical figures. Often they can be judged more as sculpture than jewelry.

Angel wearing a pearl and coral necklace and pearl bead ornament, from the Montefeltro altarpiece by Piero della Francesca (Brera, Milan).



left *The jewelry of Sybilla von Freyberg in the portrait by Bernhard Strigel*, right *Burgundian or Dutch brooch in gold, enamel and pearls, c. 1430–40* (Kunsthistorisches Museum, Vienna).

Although the famous sculptor and goldsmith Benvenuto Cellini (1500–71) left many writings and descriptions of his work, little material evidence survives, as no jewelry definitely known to have been made by him still exists. A necklace in the Desmoni collection in New York is, however, attributed to him. It is composed of eleven elaborately decorated plates of two alternating types: smaller ones with a large pearl in the center of each and larger ones with a table-cut gem. The use of color is very varied and enriched with finely decorated surfaces in enamel.

In his autobiography Cellini lists a few pieces of jewelry which he made, most frequent is the *enseigne*, and he also mentions Pope Clement VII's cope button and Pope Paul III's ring. The design with which the pope's button is embellished consists of a large diamond supporting a

figure of God the Father. The diamond itself is surrounded by three cherubs in high and half relief.

The fashion for brooches continued in the fifteenth century. Innumerable Madonnas painted at this time wear robes clasped at the breast by jeweled brooches. An important example is on the white tunic of the Madonna of the Annunciation in an altarpiece by Van Eyck in St. Bavon in Ghent. There are other examples by Antoniazio Romano, Fiorenzo di Lorenzo, Domenico Ghirlandaio and Mainardi, as well as on two of the Graces in Botticelli's *Primavera* (Uffizi, Florence), one of whom also wears a jewel at the nape of her neck.

A brooch in the Kunsthistorisches Museum, Vienna, depicting two young people surrounded by a country scene is a real artistic masterpiece. The natural appearance of the two lovers holding a garland of flowers and leaves, and the minuteness of the flowers which are made of gold and precious stones, give the composition a fairy-tale quality which contributes to its aesthetic charm. In spite of the chromatic design of the enamels, pearls and colored stones and the modeling of the figures, this work cannot be classified as a miniature sculpture or painting like some other elaborate jewels, yet it fulfils all the requirements of the art of jewelry. This brooch was part of the treasure of the house of Burgundy and was taken to Vienna by Mary of Burgundy when she married Emperor Maximilian I.

The fashion for necklaces returned in this period too. A woman in a portrait by Dürer (Kunsthistorisches Museum, Vienna) wears one of rhomboid stones, probably amber, interspaced with four pairs of seed pearls side by side. It is a modest but extremely refined piece. In Baldassare Estense's portrait of Umberto de' Sacrati and his family (Alte Pinakothek, Munich), the lady wears a necklace consisting of rows of little beads spaced out by fine chains, forming the lightest and most elegant of compositions; in the same painting the boy's skullcap has an *aigrette* (a plume usually fashioned in silver and sometimes in gold) clasped by a beautiful jewel with a rectangular stone set in gold and three pearls, the lower one being drop-shaped. In the portrait of a young girl by Petrus Christus (Staatliche Museen, Berlin) a necklace composed of three rows of little gold bars, linked by pearls, gives her a most elegant distinction.

Necklaces of gold chains of a great variety of size and shape were worn by both men and women and were particularly popular in Germany. In a portrait by Barthel Behan (Thyssen collection, Lugano) the lady wears, together with numerous other jewels, two very large chain necklaces; Jacopo Strada in a portrait by Titian





The jewels of Lucrezia Panciatichi from Bronzino's portrait (left) and those of a young girl from the Portinari altarpiece by Hugo van der Goes (below).



(Kunsthistorisches Museum, Vienna) wears several such necklaces round his neck.

As time went on elaborate necklaces became increasingly important in the adornment of rich Italian women. In the Portinari altarpiece (Uffizi, Florence) Hugo van der Goes portrays one of the daughters of a Florentine banker wearing a necklace of two rows of pearls, with a gem between every pair of pearls, and a lily-shaped jeweled pendant with a large drop-shaped pearl suspended from it.

Already from the end of the fourteenth century styles of women's headdress indicate how thoroughly the craftsmen-goldsmiths planned the line and form of meshwork and the application of pearls and little gems in the gold nets which enveloped all or part of the head. These nets were often very elaborate, as is shown in the portrait of Beatrice Sforza by Alessandro Araldi (Uffizi, Florence). Here the gold net is a design of stylized flowers covering the back of the head and ending in a spiral twist which sheaths her plait of hair.

Piero della Francesca liked to adorn the heads of his women with a single jewel suspended on a ribbon in the center of the forehead, like the one worn by one of the figures in the *Madonna dell'Uovo* (Brera, Milan), or just above the nape of the neck like the singing angel in *The Nativity* (National Gallery, London), and by Battista Sforza in his portrait (Uffizi, Florence). These jewels are very similar as they all consist of a large central gem surrounded by stylized petals, each decorated with a large pearl. In the portrait of Simonetta Vespucci by Piero di Cosimo (Musée Condé, Chantilly) a jewel of a similar design to those described is suspended from a

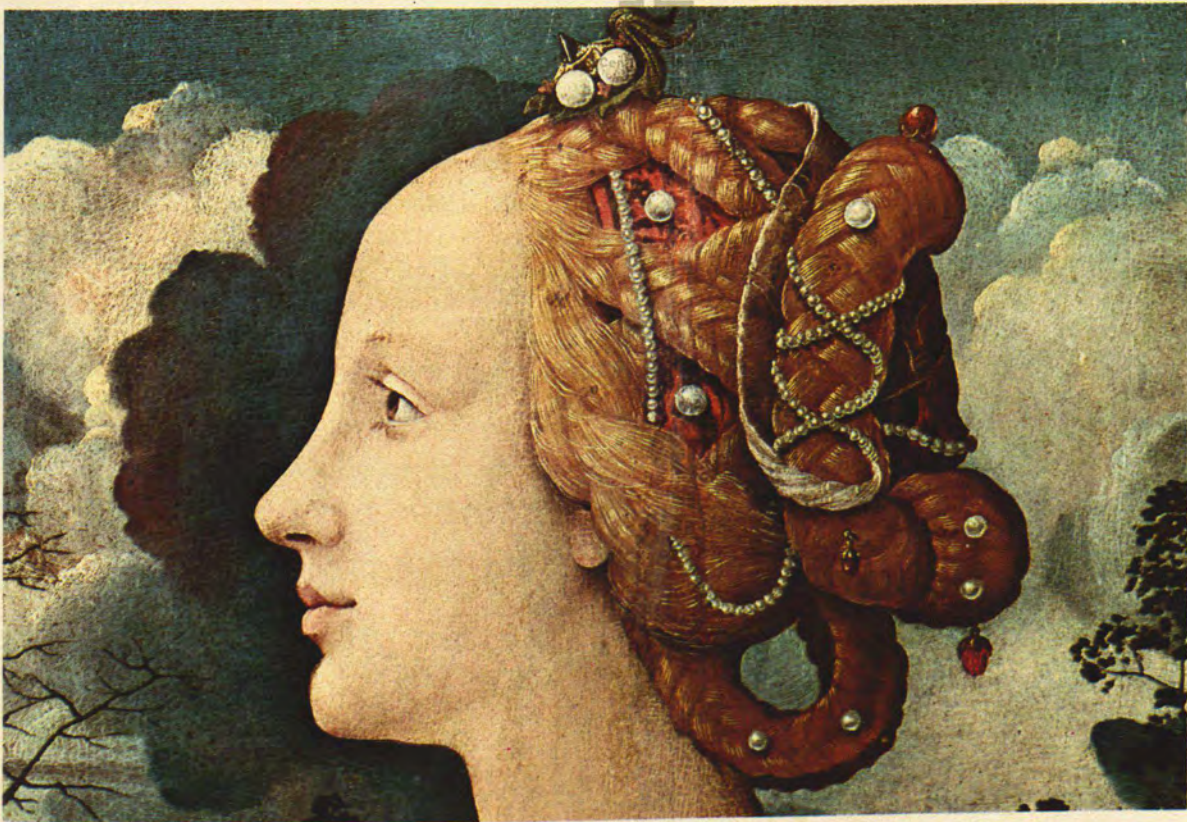
row of pearls which are knotted into the elaborate twist of a long plait.

From contemporary portraits, it would seem that in the richest European countries all sense of proportion was gradually lost. The passion for jewelry, particularly at the English court and among the rich German burghers, was indulged with so little restraint that balance and good taste were sacrificed.

Eleanora of Austria, Charles v's sister and wife of King Francis I of France, was supposed to have led a secluded life away from court. To judge from a portrait of her by the Fleming Joos van Cleve, this did not prevent her from being very vain and adorning herself lavishly with jewels. In this portrait (Museu Nacional de Arte Antiga, Lisbon), she wears a soft hat with a brim encrusted with pearls and precious stones. On the side of her head, revealed by the tilt of her hat, there is a jeweled gold band from which hangs a circular pendant containing a large bezel set with a valuable stone; from this a drop-shaped gem is suspended. The hairstyle covers her ear, but it does not hide a huge elliptical earring from which hang three drop-shaped pearls. A necklace made of the most elaborate gold and enamel medallions, each containing alternately a pearl or a ruby, stretches from shoulder to shoulder, while on her bosom below the neckline of the dress is pinned a huge jewel with a drop pendant from which another necklace of pearls, which disappears behind her shoulder, is suspended. Two more jewels pin the pleats of the fastening of the sleeves. Not content with such ostentation the royal lady holds, clearly displayed between her finger and thumb, a beautiful ring.



Jewelry and headdresses worn by Italian noblewomen: above Portrait of Beatrice Sforza by A. Araldi; left Portrait of Simonetta Vespucci by Sandro Botticelli; below Portrait of Simonetta Vespucci by Piero di Cosimo.





Queen Anne of Hungary's hat in the portrait by Hans Maler (Thyssen collection, Lugano) is as rich as the one worn by Eleanor of Austria. An Italianate jewel, oval in shape and decorated with enamel and gems, supporting a minute sculpture of a nude woman waving a long scarf, with three large pearls hanging from the base, is pinned to the sumptuously pearl-embellished brim. The queen wears no earrings or rings, but a large jewel hangs from a gold band around her neck.

But not everyone showed such little restraint. In Bronzino's famous portrait in the Uffizi, Florence, Lucrezia Panciatichi wears a careful choice of very refined jewels. A star-shaped pendant of gold and enamel with a central ruby hangs from a string of large pearls around her neck. Another necklace, worn over the shoulders, consists of gold links interspersed at regular intervals by parallelepipeds bearing inscriptions in niello. Both this jewel and the pendant have marked fifteenth-century features and are at least fifty years older than the portrait which was painted around 1540. The belt, which has an appendage resting on the right hip of the figure, consists of two kinds of oval elements, all the same size and all in agate, connected and embellished with gold. A single ring with a mounted gem completes the lady's jewelry.

During the Renaissance era rings achieved a status of primary importance, so naturally there were a great variety of designs. In the fifteenth century there was a great vogue for engraved gems and gold bezels, either with heraldic devices which could also be used as seals or with classical subjects. For the devout, reliquary rings were made; these contained a small reliquary in the center of the bezel. In most of them, the box setting was used, and the sides would be delicately decorated. A thin piece of metal foil was often placed under the stone in a box setting in order to enhance its color. The foil used for this purpose was made of gold, silver and copper alloys, and, according to the proportions of these metals in the alloy, various shades of white, yellow, red, blue and green could be obtained.

The shoulders of rings were increasingly richly ornamented with punched or pierced work, niello or enamel. There are bezels delicately decorated with enamels on the back as well as the front; some can be turned round while others open to reveal a miniature portrait, an emblem, or even a cache for poisoned powder. In another type of ring there is a scene carved in full relief and colored with enamels. In the Museo Poldi Pezzoli, Milan, two rings like this depict fauns and goats, while others have a mask with diamonds for eyes or a skull in place of the bezel. A popular type of wedding ring was made of two divisible hoops of plain gold or with hands painted in enamel; when the two rings were united the two hands interlocked.

Earrings were not much worn in the sixteenth century and bracelets still less; in portraits of ladies, who are otherwise lavishly jeweled, these articles of adornment



Sixteenth-century rings : from top to bottom a gold ring with pearls and enamel, the same ring open, and another with diamonds and enamel (Museo Poldi Pezzoli, Milan). left Anne of Hungary's jewels from the portrait by Hans Maler (Thyssen collection, Lugano).



The jewelry worn by England's sovereigns: left Henry VIII by Holbein, 1536 (National Portrait Gallery, London); right Queen Elizabeth I with long pearl necklaces (Parham Park collection, Pulborough, Sussex).

are very often lacking. Earrings, when worn, usually consisted of drop-shaped pearls or gems. Occasionally one comes across a more elaborate design in which three pearls are suspended from an ornately decorated gold element set with a gem. Bracelets could consist of one or more strings of pearls, a meshwork of chains or a sequence of medallions of various shapes and sizes (*Lucrezia* by Paolo Veronese, Kunsthistorisches Museum, Vienna).

Portraits of Henry VIII and Elizabeth I best illustrate the use of jewelry and precious ornamentation on clothes. These monarchs wore as much jewelry as possible including buttons, sleeve clasps, jeweled borders on necklines, entire garments covered in hundreds of pearls and gems, not to mention hat jewels,

jewels for the hair and even jeweled shoes, all of which show the obsessive vanity of these two sovereigns.

From the above descriptions and from those which follow it is clear that between the fifteenth and sixteenth centuries jewelry was widely produced in Europe. The many surviving examples help to give some idea of the quality of the production, while evidence of the impressive quantity is shown in the works of painters from every country. In addition to revealing the vanity of the men and women, they help us to appreciate the craftsmanship of the goldsmiths, lapidaries, enamelers and other unknown craftsmen who, under pressure from the constant demand, acquired great skill and continually perfected their knowledge.

In addition to what was being done in Italy where, as has been noted, famous artists also made designs for goldsmiths and jewelers, engravers and designers in France, Germany and England produced engravings of decorative motifs and jewelry designs, especially pendants. Although this encouraged the diffusion of the Italian Renaissance forms throughout Europe, the individual characteristics of each country were not completely eliminated. If, for example, we were to compare a Spanish jewel with a German one, the rich embellishment of the former and the greater elaboration of detail of the latter would always, or almost always, be distinguishable, even if the maker of the first happened to be Flemish and the second a Venetian. However, much more difficult is the identification of certain types of pendants which were produced over a wide area of Europe during the Renaissance. These elaborate pendants were of gold, colored with enamels and precious stones, and frequent use was made of baroque pearls especially chosen so that their shapes would form an integral part of the composition. They depict mythological or biblical scenes or persons, monsters, seahorses, dragons, reptiles, birds, symbolic figures, sailing ships, portraits and so on. The production of this type of jewel continued until the beginning of the seventeenth century.

Another art which became very popular at this period, which also harked back to classical models, was the art of intaglio cutting on cameos and gems. On an agate intaglio in the British Museum a seated nude female figure is portrayed from the back in a pose which is certainly inspired by a silver disc from Canosa (Museo Nazionale, Taranto). Another gem engraved in the antique Hellenistic style shows a man, a woman and a child doing a Bacchic dance, their movement being depicted with uninhibited dynamism.

Italian Renaissance lapidaries were also highly skilled





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the Study of
Indian Culture

in their art. First Florence and Rome, and later Venice, were centers in which this art was greatly cultivated. The collections of Pope Paul II and Lorenzo the Magnificent were famous, and the work of engravers was highly appreciated. For a cornelian engraved in 1471 with a portrait of Pope Paul II, Giuliano del Scipione received at least two hundred ducats in payments. Giovanni delle Corniule of Pisa, one of the most famous engravers, made two portraits on cameos, one of Savonarola and the other of Lorenzo the Magnificent. A famous emerald seal engraved with the figure of Hercules, which from the technical point of view presented almost insurmountable difficulties, is attributed to Pietro Maria Seobaldi, and dated 1532. Matteo del Nassaro, a Veronese lapidary, went to work at the court of Francis I of France in 1515, and the Milanese, Alessandro Masnago, was in the service of Rudolph II of Austria; other Italian engravers dispersed in various European centers spread the style and technique of this difficult art. The fame of Valerio Belli (1468–1546) was international, but as with other artists in this field, only a few objects are definitely known to be his, these are some splendid pieces of gold, most notably several inlaid with rock



Pendant with cameo by Ottavio Miseroni, sixteenth century. right French sixteenth-century cameo with seventeenth-century mount. left Pendant from southern Germany, c. 1560–80, in gold, precious stones, enamel and pearls.



crystal. Towards the end of the century Milan became one of the most active centers for the production of cameos and engraved gems.

When medallions were first framed for use in jewelry they were plain or simply decorated with engraving or enamel. Later the frames became increasingly elaborate, the medallion itself smaller, and the figures were depicted with more color and ever greater boldness. A particular feature of these pendants is the decoration on the flat reverse side, which varies from modest engraved arabesque patterns to colored figurations in translucent enamel. They were also inscribed with mottoes or dedications. The frames eventually became so elaborate, with traceries of scrolls, cartouches, name plates in openwork, that they swallowed up the medallion



Brooch of gold, enamel and baroque pearls from the collection of the grand duke of Tuscany, seventeenth century (Museo degli Argenti, Florence). right Pendant in gold, enamel, precious stones and baroque pearls, late sixteenth century.

altogether, and the composition became entirely decorative, rich with color and highly animated forms.

In Germany the famous centers of Augsburg and Nuremberg maintained a tradition of artistic metallurgy which was amongst the highest, and during the Renaissance these towns produced some pieces of great value. Skilled artists like Erasmus Hornick, Hans Muelich, Virgilius Solis and Theodor de Bry kept his tradition alive with their work. Other centers of notable importance were Munich and Basle. Prague under the patronage of Rudolph II, an enthusiastic collector, had many goldsmiths' shops where highly skilled artists and

foreign craftsmen worked; among these was the Italian stonecutter, Miseroni.

Francis I of France was also a noted patron; he surrounded himself with famous Italian artists, among them Leonardo da Vinci and Benvenuto Cellini who, inevitably, were the dominating artistic influences at Fontainebleau. In Paris artists such as Jean Duvet, Etienne Delaune and the Dutchman Abraham de Bruyn were the foremost jewelry designers.

It is Hans Holbein the Younger who can claim the merit of having introduced Renaissance jewelry to England. He found fertile ground in Henry VIII's great





left Pendant in gold, enamel, diamonds and pearls (1581) and (below) design for the same pendant, both by Hans Collaert (private collection, Pforzheim and Victoria and Albert Museum, London). right necklace of small, linked segments, probably Nuremberg, c. 1530.



passion for jewelry, an obsession which was to manifest itself again later in his daughter Queen Elizabeth. The English court also welcomed a considerable number of French, Italian and Flemish craftsmen and goldsmiths. The jeweled monogram brooch was very popular at the English court. Men, almost more than women, loved to adorn themselves with earrings. The ship motif in brooches, pendants and *enseignes* probably spread from England where, as a result of her supremacy at sea, it had become almost a national emblem.

Spain in the sixteenth century was considered the richest country in the world. Her growing trade with the orient and the conquest of the American continent brought to the peninsula an enormous amount of treasure. The traditional tendency of Spanish taste was towards rich use of color, and this was combined with forms of jewelry derived from the Italian Renaissance. Earrings lavishly decorated with long pendants were



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left *Portrait of Isabella Clara Eugenia with Magdalena Ruiz* by Felipe de Liano. right French or German brooch in gold, enamel and diamonds, c. 1630 (Prado, Madrid and Victoria and Albert Museum, London).

more popular in Spain than elsewhere. In addition, religious jewelry, such as portable reliquaries, crosses and pendants carved with sacred subjects, was widely used. A technique brought to its finest peak by Spanish jewelers was *verre églomisé*, which involved painting the underside of a piece of glass or rock crystal with a design (usually a religious scene) in colors and goldleaf, and mounting it on a decorated frame embellished with gems and gold. Spanish jewelry is also distinguishable for the more intense use of filigree and enamel decoration on the ever-increasing number of gems.

The trends in style of the Renaissance blended in with the manifestations of the baroque era at the turn of the sixteenth century. These developments took place in Italy a little earlier than in the rest of Europe, but we shall see how in the second half of the century France became the more advanced nation.

The gradual stylistic development of jewelry at this period was mainly conditioned by two important factors. The first is of a technical nature and concerns the improvement of methods of cutting precious stones. This had a notable effect, for gems began to take over from gold as the most important part of the jewel. The second was a great vogue for the cultivation of flowers. Floral and vegetable subjects thus became fashionable in jewelry design and were spread throughout Europe by means of prints.

The unconscious initiator of this fashion was a Parisian, Jean Robin, who at the end of the sixteenth century set up greenhouses to cultivate exotic flowers to be copied by embroidery designers. A few years later the greenhouses were bought by Henry IV and became known as the *Jardins du Roi*; they are now in the Paris botanical gardens. This increasing interest in exotic plants was copied in other countries too, encouraged by the intensification of trade with the orient from where the seeds of such plants and flowers were imported. The first tulip was grown in Europe at Augsburg in 1559. The creative interest of jewelry designers was excited and inspired by the wonderful fantasy of nature's forms and colors, which offered infinite possibilities and variations of interpretation.

The important publications, *Livre des Ouvrages d'Orfèvrerie* (1663) and *Livre des Fleurs propre pour Orfèvres et Graveurs* (1680), which set out the new stylistic ideas, contributed greatly to the spreading of the new jewelry styles throughout Europe.

These "inventions," as they are called in the books, were principally inspired by flowers, but also show a noticeable development in the use of openwork knots and ribbons, which give the pieces an appearance of



great complexity. The wide use of faceted diamonds and other precious stones covering almost the whole design of the jewels gives an appearance of lightness.

At first medallions, insignias, brooches and necklaces were made up of rather bulky components, encrusted with diamonds and emeralds and decorated with leaf and tendril motifs in which the art of the goldsmith and enameler prevailed; later this repertoire was completely forgotten.

In addition to diamonds, pearls also invaded the jewelry of this period as they were particularly suitable, either singly or in clusters, for floral designs. A good



example is a pair of earrings in the Museo Poldi Pezzoli, Milan, in which the design is made up entirely of pearls with white enamel and gold. The leafy and floral motifs testify to the goldsmith's skill in the execution of this complicated work but are hidden by the enamel and pearls. *Aigrettes*, necklaces and brooches continued to include floral, leafy and ribbon designs which were frequently carried out in openwork. The invisible joining of curving, intersecting, protruding or receding features together with the polychromy contribute to the structural coordination, separating the decorative aspects from the rest so as to achieve a balance and unity in the composition.

In the seventeenth century the diamond, which had previously been little used, partly because of the difficulty of cutting, came into its own. This was due above all to the market being flooded with diamonds from the newly discovered South American deposits. The chief form of diamond cut used until then was the pyramid, sometimes called the writing diamond from the fact that its point was so sharp that it could write quite smoothly on glass. This shape generally corresponded with the natural octahedron form of the crystal. However, table, square or rectangular cuts were also used. The situation underwent a radical change in 1640 thanks to Cardinal Mazarin's patronage, which enabled lapidaries to experiment. A new cut with thirty-two facets more than the table cut was discovered.

From then on the diamond assumed the first place amongst gems, and it became the most fashionable stone. This period also saw great fluctuations in the prices as a result of the market being flooded with diamonds from overseas. Obviously other precious stones were also affected by the new cutting technique and continued to play an important part in jewelry.

France became the *arbitrator elegantiarum*, and the king and his favourite ladies led the fashion. Louis XIV had two diamond *parures* for decorating his jerkin and suit. One included 123 buttons, 300 eyelets and 90 frog-fastenings for the jerkin in addition to 48 buttons and 96 eyelets for his suit; the other consisted of 168 buttons and double the number of eyelets, plus 19 fleurons for the jerkin and 48 buttons with the corresponding number of eyelets for the suit. Both these *parures*, as matching sets were called, included a knot in which to fold the brim of the hat, garters, the Cross of the Holy Spirit and a sword hilt.

This profusion of jewelry involved the whole court, including the nobility of Paris and the provinces. But the king's grandiose visions, the work of the indefatigable finance minister Colbert and the collaboration of the court painter Le Brun contributed to an intense renovation and development of the decorative arts in France. The most skilled Italian, Dutch, French and German craftsmen worked in the Louvre workshops, producing the highest quality tapestries, lace, furniture, metalware and sculpture with which to furnish the



The Order of the Knights of St. George, made of gold, enamels, pearls and precious stones, c. 1570–75; it belonged to Duke Albert V of Bavaria. left Gold, enamel, diamond and pearl badge of the house of Bavaria; on the back are the mottoes "Maximilianus Bavariae Dux" and "Dominus Virtutum Nobiscum" (Schatzkammer der Residenz, Munich).



Gold, silver and diamond aigrette. left Gold, enamel and gem necklace, seventeenth century (both at Museo Poldi Pezzoli, Milan).

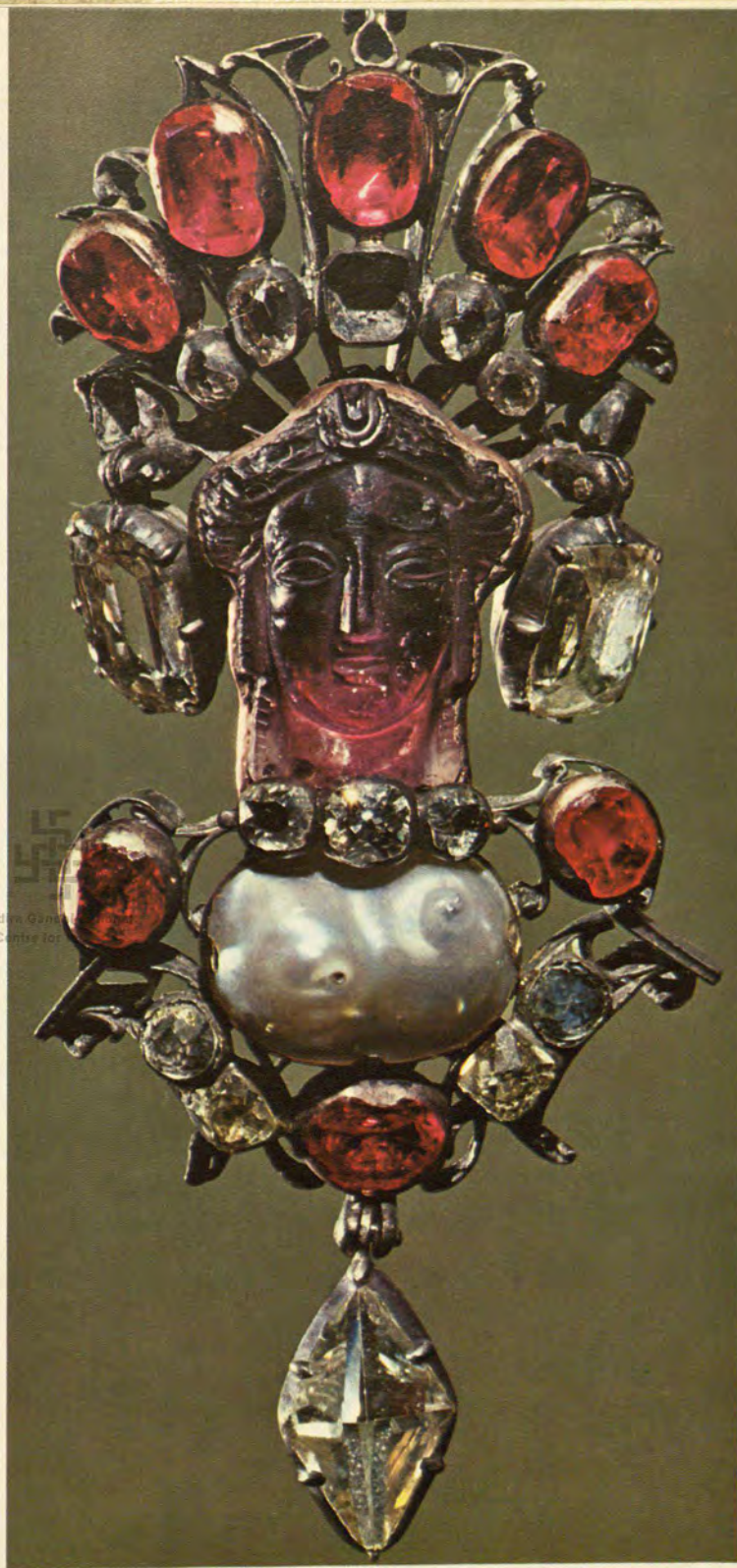


palace of Versailles, the most bombastic expression of the Sun King's ideas.

A new precious ornament for decorating bodices came into fashion at the court of Louis XIV. It was first worn by men, in fact the duke of Orleans wore such an ornament to a ball at Fontainebleau in 1667, whereafter it spread among noble women throughout Europe.

The bodice ornament of *crochet* from the Virgin of Pilar treasure in Spain is to be noted for its magnificence. It is a complex, openwork composition of scrolls, branches and leaves in gold with a big central flower in which a large emerald is mounted. The branches and other flowers, which are studded with emeralds, diverge from the center and form seven gold pendants. The central pendant, which is very large, contains five emeralds, and the whole jewel comprises forty-six emeralds in all.

Much less jewelry has survived from this and the succeeding epoch than from the preceding period. This was because the material worth of a Renaissance jewel was small compared with its artistic value, and the amount of gold and gems recoverable was insignificant in comparison with a piece of jewelry from the baroque or succeeding period consisting of numerous precious stones which could easily be reused.



Italian pendant in gold, pearls and precious stones, late seventeenth century (Kunsthistorisches Museum, Schatzkammer, Vienna). A baroque pearl has been used to represent the woman's breasts.

The eighteenth century was a period of great evolution and development in jewelry. Decorative forms changed radically, and tastes were completely transformed. The symmetrical and architecturally derived baroque forms gave way first to the artificial and asymmetrical *rocaille* style derived from rococo, with its voluptuous elegant lines, and finally to the florid but refined forms of the classical revival. In France the great expansion in the decorative arts begun by Louis XIV continued, and in furnishings and costumes Europe, from Spain to Russia, became a French province.

The quality of the products was far superior to that of previous centuries. In order to obtain the required standards of refinement, furniture makers would even send their pieces, or parts of them, to China to be decorated with the authentic lacquer.

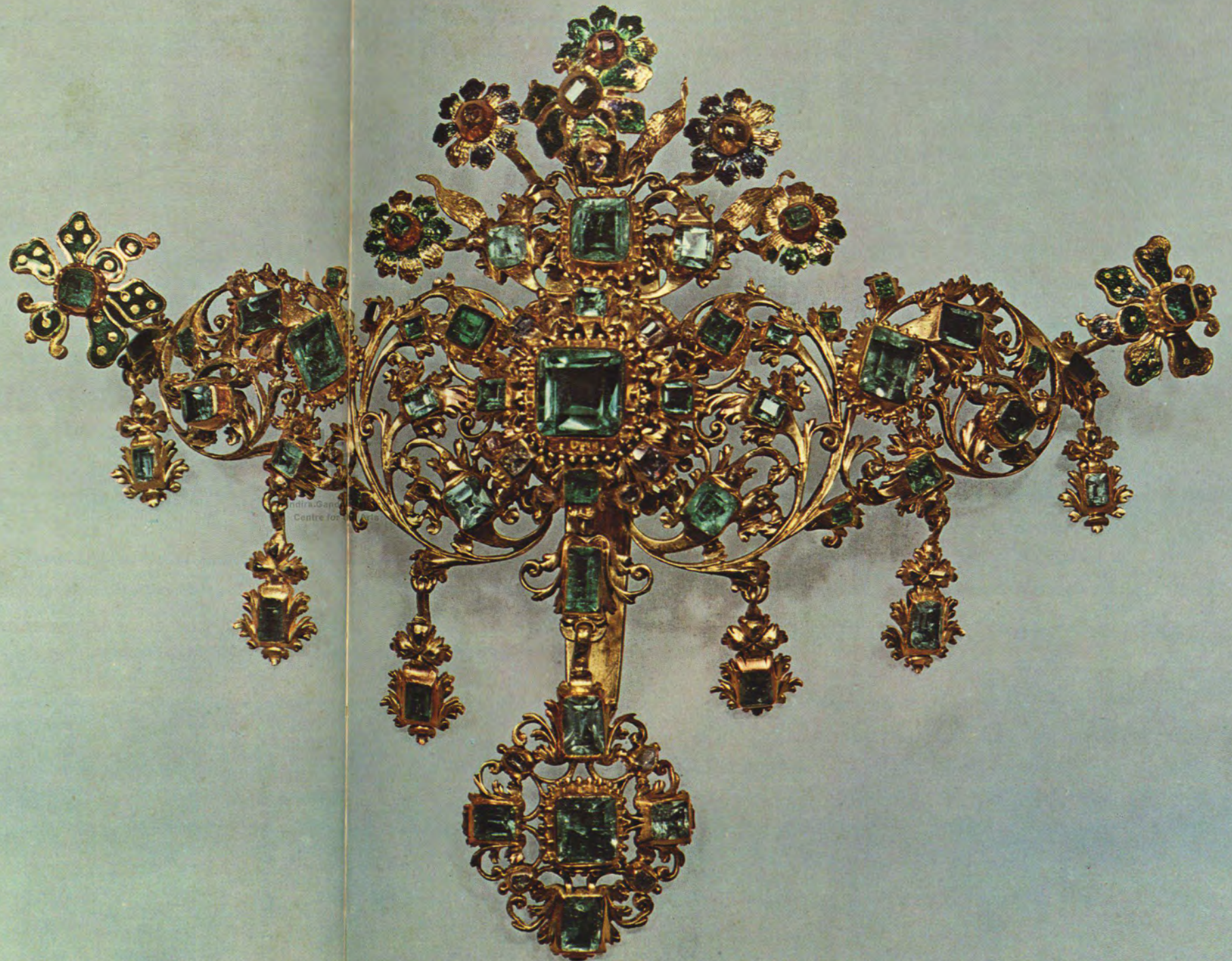
The five official favorites who were always by the side of Louis XV were very important in the development of jewelry. Similarly many other ambitious aristocrats encouraged, by their demand for precious ornaments, the opening of numerous new jewelry shops in the French capital.

Jewelry also became increasingly popular amongst the prosperous bourgeoisie; the demand became so great that by 1767 there were in Paris at least 314 jewelers, working exclusively with imitation gems, particularly diamonds. Doubtless the workmanship and design of pieces made with these stones differed little from those in which real gems were used; in an age when labor was cheap and, therefore, added little to the price of the article, the lower cost of the material was of a great advantage to the buyer.

Thus in the field of imitation gems, the eighteenth century saw the development of a huge industry, above all in England and France, countries where remarkable results were achieved. Apart from the lead glass or strass pastes, which were faceted and mounted just like real stones, another imitation of the diamond was made from fused beryl or quartz, but this was only used in more valuable articles. Other forms of imitation jewelry were marcasite and cut steel. These were so successful that by the nineteenth century there were firms in England specializing exclusively in the manufacture of cut-steel jewelry.

In addition to imitation stones, there was imitation gold; the type evolved by the Englishman, Christopher Pinchbeck, consisting of an alloy of copper and zinc, was the best. It had great success and was widely used in the making of shoe buckles, buttons and particularly watch cases.

Towards the end of the seventeenth century the Venetian lapidary, Vincenzo Peruzzi, discovered the



Bodice ornament or crochet with emeralds and enamel flowers, from the treasure of the Virgin of Pilar, Spanish, mid-seventeenth century.



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brilliant form of diamond cutting. The shape and position of the fifty-six facets in Peruzzi's cut caused the light which entered the stone to be reflected back through the same facets which received it. Thus far greater brilliance was obtained than in the Mazarin cut of thirty-two facets. The already increasing predominance of gems in jewelry now knew no bounds, while the goldwork declined to merely being used inconspicuously in settings and frames.

Topazes, amethysts, white and blue sapphires, opals and peridots were used in the same ornamented motifs as diamonds; these stones and rubies and emeralds, in smaller quantities, were among the favorites. The constant changes in fashion were a disaster as far as the survival of pieces is concerned, and for this reason the richest documentation of eighteenth-century jewelry is to be found in designs and engravings. However, jewels are rarely shown in contemporary portraits; neither Queen Marie Leczinska nor Madame de Pompadour in the portraits of them by Jean Marc Nattier and Maurice Quentin de Latour wear any jewelry.

Decorative motifs continued to be inspired by floral forms, often embellished with leaves and branches, the occasional scroll work and ribbons arranged in one or more tassels or in decorative bows; sometimes all of them would be grouped together on one piece. Until the advent of neoclassicism, eighteenth-century jewelry was composed almost exclusively of precious stones of various sizes, shapes and colors.

Necklaces in the first half of the century were of the collar type, often consisting of a velvet ribbon with one or two pendants suspended from it in succession or with one pendant in the center and one on each side. A style of necklace which was very fashionable was the *rivière* – a name still used today – which was usually composed of a row of large single stones, generally diamonds, often bordered by rubies or emeralds. A very good example of this style is a necklace in the Museo Poldi Pezzoli, Milan; it consists of an openwork band along which a ribbon runs, forming intermittent bows. A large flower from which two other flowers hang forms the centerpiece. The whole design is surrounded by small diamonds, the flowers and ribbons are made of topaz while some of the leaves are pink diamonds. Like nearly all pieces of the time, it is set in silver, and each stone is held in place by a convex element which is designed to enhance the reflection of light from the stones.

A portrait, which perhaps gives the most complete idea of the precious ornaments which might have been worn by an eighteenth-century noblewoman, is of Matilde Querini painted by Pietro Longhi (Musée Nationale des Beaux-Arts, Algiers). She wears a rich *parure* of diamonds consisting of an *aigrette*, together with at least seven other jewels scattered in her hair, as well as earrings made of three round gems set in a triangular shape with *briolette* pendants, and a diamond collar necklace made of curved elements matching those

Bow-shaped hat pin with pink diamonds surrounded by brilliants by J. Storff (1765), commissioned by Joseph Maximilian III (Schatzkammer der Residenz, Munich).
right Necklace in brilliants, pink diamonds and topazes, Italian, eighteenth century (Museo Poldi Pezzoli, Milan).





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on the bracelet. In addition to rings, she has a long pearl necklace pinned to the left side of her décolleté by an *aigrette* brooch.

In Louis xv's time the *aigrette* enjoyed great popularity and was worn until the advent of neoclassicism. Its jeweled stems were often made in such a way that they shook when the head moved, thus showing off to greater advantage the brilliance of the diamonds.

A jewel which had already appeared by the end of the preceding century and which developed greatly in proportions and richness in the eighteenth century was a bodice ornament which the French named the *Sévigné* brooch. It was placed under the neckline and was in the form of a large upturned triangle, its lower point reaching to below the waist. It usually consisted of a large, multiple bow of ribbons to which openwork floral motifs intertwined with scrolls were attached lower down. This was an ornament which was always worn

far left *Marie Louise de Bourbon's jewelry as depicted by L. Pécheux in his portrait of her, and that of Matilde Querini (below left) by A. Longhi. left A French eighteenth-century chatelaine. right A golden fleece with oriental garnets, brilliants and rubies, German, c. 1760–70.*

over the bodice and it became very popular in France and England and, to a lesser degree, in Italy. Queen Marie Leczinska of France wears a beautiful *Séviigné* on her bosom in the official portrait of her in the Louvre, Paris.

Brooches in the shape of one or more bows from which might hang pendants of various shapes and designs were the mode in the first half of the century. Jewelry, especially brooches, submitted for a short period to the capricious asymmetry of rococo, using shells, scroll, volutes from the rococo repertory. Some rococo jewelry designs attributed to Girolamo Venturi are conserved in the Cooper Hewitt Museum for the Decorative Arts, New York.

Later, in the second half of the century, brooches in the shape of bunches of flowers made of diamonds or stones of various colors appeared. At first their designs were somewhat stylized, but then they began to be more naturalistic.

The insignia of the golden fleece, worn by sovereigns, began the vogue in the eighteenth century for jewels of spectacular magnificence. The most rare and beautiful gems in royal collections were mounted in splendid ornamental compositions which became sumptuous symbols of distinction.

Among the simplest of earrings were those using one or three drop pearls, in which the central one would be the longest. The *girandole* earring consisted of three pear-shaped drops suspended from a large stone, nearly always a diamond and unusually circular, set at the top. A rich example of this type of earring is worn by the Bourbon Queen Maria Amalia in a portrait painted by Raphael Mengs.

Another ornament characteristic of this century was the chatelaine. This was an ornamental chain which was fastened to the belt or pocket sometimes composed of elaborate linked and molded gold elements in various shapes and sizes, with *repoussé* scenes depicting biblical or allegorical subjects or themes from classical history in elaborate rococo frames. Chains of various lengths hung from projecting points, terminating in spring hooks, which were used by men to hang their watches, keys and other accessories on, while ladies would hang such objects as little prayer books, sewing cases, scissors, little jewels or keys. Already in use by the end of the preceding century, they became in this period, together with the watch case, the only things in which gems were rarely used, and the most refined expression of the goldsmith's art.

The floral motifs were also used on rings. The hoops were often finely wrought in leafy or scroll designs, and

the bezel would be in the form of the petals of a flower. Oval gems were preferred for settings.

In the second half of the century and particularly in the neoclassical period the marquise ring enjoyed a great vogue. This is characterized by an oblong bezel set with one large colored stone, most often a sapphire, encircled by a double or even a triple row of little diamonds; later the central piece was often a cameo framed in plain gold or a stone engraved in the antique manner. Onyx, chalcedony or rock crystal were also used, and the types and combinations of the stones were innumerable.

The great events of the last thirty years of the eighteenth century were the amazing archaeological discoveries at Pompeii and Herculaneum, which drew scholars, architects, artists and engravers, particularly





from France and England, to Rome and Naples to study the excavations. The man whose studies and writings had the greatest effect on the art and tastes of this period was the Prussian Johann Joachim Winckelmann. His views on harmony based on classical Greek ideals found favor and provided inspiration in all branches of the arts. The study and appreciation of the architectural, plastic and decorative works, which were revealed and which were publicized through prints, had a decisive influence on the tastes and form of European decorative arts and ushered in the period of neoclassicism.

Florid ornamental lines were gradually abandoned for greater simplicity and more disciplined composition. Unlike the Renaissance era when classical forms had been reinterpreted in terms relevant to the contemporary arts, neoclassicism took ornamental motifs almost directly from the Greco-Roman models. Thus, for instance, cameos depicting mythological figures and scenes came back into vogue.

An important contribution to the new jewelry styles was made by the English pottery manufacturer, Josiah Wedgwood. In his famous factory he perfected a technique of producing cameos with special, very hard, fine pastes called black basalt and jasper. He worked in collaboration with sculptors such as John Flaxman on jewelry which was mounted and sometimes decorated with cut steel. The subjects were classical scenes taken from Greco-Roman models. An exaggerated refinement, a charming fluidity of line and a note of romantic sentiment characterized Wedgwood cameos, giving

them a certain vitality which was very far from the severe classical spirit. These oval, round or octagonal plaques, framed in gold, were used as medallions, brooches and as parts of diadems, belts or bracelets. The colors were usually white on a light blue, light green, black or buff background.

This period also saw the revival of the use of enamels on decorated plaques. Brightly colored rustic or domestic scenes were also popular, as were sober enamel pictures in the gray monochrome grisaille technique. The quality of the workmanship was very high.

Pearls and precious stones, though still frequent in important jewelry, were less popular. In keeping with the new styles, they were used more sparingly, with stricter symmetry and greater discipline.

The French Revolution brought an abrupt end to the manufacture of and taste for elegance and sumptuousness, but this was only to be a temporary phase.

above Earrings predominantly made of cut diamonds, eighteenth century. right The jewelry of Infanta Maria Ludovica as shown in the portrait by Raphael Mengs.





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The eclectic curiosity of the nineteenth century and the return of all styles

Hitherto, precious ornaments had been directly related to the social rank of the wearer, but this relationship was completely and for ever destroyed by the industrial revolution.

The first symptoms of this phenomenon had already manifested themselves with the manufacture of imitation precious stones, pinchbeck gold and the use of cut steel and ceramics. This now expanded widely, and the results are often of little artistic interest. However, besides mass production, there still survived in the nineteenth century craftsmanship of quality.

In France the revolution was followed by a period of austerity imposed by the political climate in reaction against the excesses of the court circle, and simplicity was the keynote of fashion. However, with Napoleon's reestablishment of the court, the *citoyen* style gave way once more to the old extravagances. Paris soon acquired again her old and glorious position as the leader of European fashion, both as regards clothes and precious ornaments. Napoleon lost no time in repossessing himself of what remained of the crown jewels, carried off during the troubled days of the revolution, and in having new and sumptuous jewels made for his empress, Josephine. Her example was widely followed in the court circle.

The nineteenth century is characterized by a stylistic eclecticism which derived inspiration above all from literary sources. Archaeological discoveries, political and artistic events and the industrial revolution also contributed to the sudden and radical changes in jewelry forms and materials in this century.

In the many fashions of varying duration which succeeded each other during this period jewelry styles all drew on past eras for inspiration, according to what suited the current political mood. There were revivals of Gothic, Renaissance, Greek, Etruscan and Roman, of rococo, naturalistic, Moorish and Indian styles and even imitations of the jewels found during the excavations of Troy. None of these forms escaped the embellishments of Romanticism. In England, commemorative and mourning jewelry, depicting subjects full of pre-Romantic sentimentalism and melancholy, which had a vogue at the end of the eighteenth century, returned to

Detail of a portrait of Queen Caroline of Naples by François Gérard in which she wears a necklace, earrings and diadem of gold, pearls and turquoises (Château de Malmaison).

Detail from The Coronation of Napoleon by Jacques Louis David in which princesses can be seen wearing necklaces, Greek-style garland diadems, earrings and jeweled belts.

fashion during Queen Victoria's widowhood.

However, these revivals rarely contained anything of artistic interest and are often mere pastiches which have no meaning or depth. They are responsible for the indiscriminate discrediting not only of jewelry, but of all nineteenth-century decorative art.

The industrial revolution had its first stirrings in England, where in the field of jewelry Birmingham became the manufacturing center for pierced-work iron medallions depicting ornamental scenes and figures for mounting in gold for necklaces, bracelets and brooches.

Later the *pavé*, which had already been in use in the previous century, became very popular; small turned-over metal beads made it possible to hold in place many tiny diamonds or other stones (such as turquoises) very close together. The idea was that the stones should cover as large a part of the surface as possible with very little metal showing between them. In monture illusion the edges of the metal rim surrounding the stone, usually a small diamond, are cut in such a way as to appear to be part of the gem.

Diamonds, emeralds and rubies remained the favorite stones for important or court jewelry. Small diamonds often served to frame large colored stones, usually sapphires, amethysts and topazes. The opal became widely used as a result of the discovery of vast deposits in Australia. Turquoise, malachite, jet (often called black amber) and coral were also popular at different periods.

After the interlude of the *citoyen* style, which was a mixture of mild classicism with patriotic emblems and motifs in semiprecious ornaments of little intrinsic value, the rhetorical conventionalism of the empire style came in with the Napoleonic era. This was a stiff and heavy interpretation of classical motifs in which eagles, rams' heads, Greek key patterns and laurel wreaths, together with other motifs of the Greco-Roman period, constituted the principal elements.

The painting by David of Napoleon's consecration as emperor admirably records the pomp and magnificence of the ceremony. Among the numerous onlookers, one group of lavishly jeweled noblewomen – Napoleon's sisters – stands out. They all wear coronets. Two are in the form of laurel wreaths and are reminiscent of a Greek ornament of the fourth century BC with copious use of pearls and cameos. This and other pictorial evidence, such as the portrait of the Maréchale Lefèvre (*Madame Sans Gêne*, painter unknown) at Versailles, and that of Queen Caroline of Naples by Gérard at Malmaison, show how the taste for luxury had revived and was reflected, with slightly less abundance, in the wealthy bourgeois circles.



Together with the large number of precious stones and pearls, one finds in this period a certain basic stylistic trend through which jewelers, goldsmiths and enamellers found the means of showing off their skill. Amongst the most famous jewelers who worked for Napoleon was Etienne Nitot who, amongst other things, created the tiara of gold and precious stones which the emperor gave to Pope Pius VII.

For gala occasions *parures* returned to fashion, and shell and Wedgwood cameos, imported by the Paris jewelers and mounted in various articles such as chains, bracelets and chatelaines, were widely used. In addition to the ear of wheat motif, flowers, particularly jasmine branches, were widely used for diamond jewelry.

During the restoration period, when Louis XVIII and Charles X reigned, jewelry styles were dominated by imitations of Roman jewelry. Earrings and small Spanish-style combs were decorated with Pompeian motifs, miniature mosaics (especially favored by Roman jewelers) and embellished with pearls, ivory, tortoise shell and, above all, coral.

Paris continued to dictate fashion, but England, too, interpreted the literary and archaeological events in fashions. New vogues were set off by the successful novels of Sir Walter Scott or poems by Lord Byron. Thus the "cathedral" or Gothic style influenced jewelry with its crenellations, gargoyles and allegorical figures modeled in high relief on buckles or brooches, often embellished with cabochon stones.

The uniformity of the finish and a certain coldness in the forms of these jewels are evidence of the futility of taking artistic elements of one epoch from the environment in which they had evolved and transposing them into objects inspired by a superficial romantic admiration. The only name worth mentioning with regard to effective work in this style is that of François D. Froment-Maurice (1802–55) who lived in Paris. His jewelry, which emulates the medieval style, retains a sense of culture, and can be seen in the Musée des Arts Décoratifs, Paris.

For a short period around the 1840s, Moorish styles were fashionable in England and France, following the interest shown in oriental painters and their work and echoed in the publication of Lord Byron's *Lara, a Tale* and *The Corsair*.

The Louis Philippe era in France, lasting from about 1830 to around the middle of the century, saw a return to the Renaissance styles with jeweled hairnets, chains (*chaîne de forçat*) and jewels with enameled panels or markedly romantic subjects. In the same period the jeweler Frédéric Philippi created pendants and pins representing monsters, using baroque pearls and vividly colored enamel.

The middle of the century saw a return to naturalism in France, with ornaments again in the shape of flowers, bouquets, stems and branches, while in England the publication of Layard's *Nineveh and its Remains* in 1848 introduced Assyrian motifs into jewelry.

Mourning jewelry, making extensive use of jet, was widely worn in England from 1861, the year in which the Prince Consort died. This substance, which cannot really be called precious, is mineralized vegetable matter similar to lignite and anthracite, of a velvet-like black and easy to work. One of the best and oldest sources of jet is the Yorkshire coast around Whitby.

In addition to its use in mourning jewelry, it was used in styles imitating those of Pompeii, as can be seen from a *parure* of finely carved jet in the Museo Poldi Pezzoli, Milan. Of the same period is another *parure* in the Egyptian style in the Musée des Arts Décoratifs, Paris.

During the Second Empire the brilliant-cut diamond came back into fashion together with other precious stones. The court of Napoleon III wanted to evoke the pomp of Napoleon I's court, but their jewels were mainly in the style of Louis XVI.

Meanwhile in St. Petersburg Carl Fabergé's organization rapidly developed, producing very refined jewelry in all styles, and introducing good ideas from an aesthetic and especially from a technical angle.

A Roman, Augusto Castellani (1829–1914), in continuing his father's work, considerably improved his technical virtuosity. He had inherited his father's passion and enthusiasm and, fascinated by the delicacy of workmanship in Etruscan jewelry, made a thorough research into ancient techniques. He collected antique jewelry and his collection can be seen in the Museo Villa Giulia, Rome. Castellani published many essays, the

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Silver brooch in the style of Wagner and Rudolphi, c. 1840. top Earrings by Eugène Fontenay (1823-87) with busts of cherubs in lapis lazuli. right The parure of Maria Amalia de Bourbon as shown in the portrait by V. Lopez.

most important being *Della Orificeria Italiana* (Florence 1862). His products were marketed under the name of "Italian archaeological jewelry."

Another aspect of Castellani's artistic activity was his interest in traditional Italian peasant jewelry which he also collected; this collection is now in the British Museum. He made silver hair pins in the form of daggers, arrows, anchors and javelins, bracelets as heavy as handcuffs and lockets as big as hand mirrors, which were popularly received and influenced jewelry production in the European capitals.

At the same time the Neapolitan jeweler, Carlo

Giuliano, was working in London. His jewels, also in imitation of classical styles or consisting of varied stylistic elements, were executed with a highly refined use of gold as well as enamels, pearls and precious stones.

Towards the end of the century the distinguished Parisian goldsmith Alphonse Fouquet, in collaboration with the sculptor Belleuse, the engraver Honoré and the enameler Grandhomme, produced a series of heavy jewels in the Italian Renaissance style (Musée des Arts Décoratifs, Paris). There are enameled medallions of various shapes and busts of beautiful sixteenth-century Italian women taken from the pictures of famous masters.

By now the period of the *belle époque* in Paris was at its height; balls, theaters and society parties provided many occasions for the nobility to don their fabulous tiaras, *rivières* and *parures*. The spread of the use of diamonds at this time was made possible by the ever-increasing number of stones coming onto the market from the newly discovered rich South African deposits.

The rise in the standards of living in the nineteenth century, especially in the countries where the industrial revolution was most advanced, created a demand for the manufacture of jewelry at prices which were more acceptable to the newly prosperous middle classes. Factors which determined this diffusion were the invention of electroplating, the increased production of imitation stones and the use of machines which made possible the stamping of hundreds of different elements for jewelry.

Electroplating is a process which makes possible the covering of a metal object (silver, copper or bronze) with a thin uniform layer of another metal (gold and silver) for decorative or protective purposes. With gold it is possible to obtain layers of only a thousandth of a millimeter in thickness.

In 1802 the Italian chemist Luigi Valentino Brugnatelli succeeded in covering some silver medallions with a thin plating of gold through a cathode process in an electrolytic bath consisting of a solution containing ions of gold. But the practical application of electroplating for the gilding and silvering of objects became possible only from about 1840 onwards through the work of G. R. and H. Elkington and J. Wright in England, the firm of Christofle in Paris, and W. Siemens in Germany.

There was a great increase in the use of lead glass pastes with Ravenscroft's methods being used in England and those of Strass on the continent. And Birmingham, England was noted for its stamping industry.



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The nineteenth and twentieth centuries: industry, artistic trends and master jewelers

In the second half of the nineteenth century industrialization and new ways of manufacturing were beginning to affect ever-wider areas. The small cottage and craft industries, often carried on by one family in their shop, were being gradually absorbed into the new large organizations.

Industry brought other momentous changes too: coaches were replaced by trains, sailing ships gave way to steam, electricity took the place of candlelight, and bicycles were used instead of gigs. Luxury was more ostentatiously displayed than in the past: the old Roman and Florentine palaces were reproduced throughout Europe, as were the châteaux of the Loire, Louis xv furniture and anything else which would contribute to an appearance of richness and nobility. The new mechanical methods of industrialization were admirably adapted to supplying the requirements of society. Jewelry was affected too on all levels.

Among the first firms to respond to these new demands was that of Fabergé, the Russian jeweler. Peter Carl Fabergé was born in St. Petersburg on 30 May 1846. After thorough studies in Russia, Dresden and Frankfurt, and educational journeys to London, Italy and Paris, he joined the family firm, which his father, Gustave, had started in 1842. His first colleague and teacher was the Finn, Peter Hiskias Pendin (died 1882), who had worked with his father. His visits to Paris and Dresden, where he frequently went to the Grüne Gewörbe Museum, left a marked imprint on his style.

The peak of Fabergé's career came at the World Exhibition in Paris in 1900 when he displayed for the first time all the imperial Easter eggs he had made, plus a selection of other "luxurious objects," and was proclaimed *Maître* and awarded the Légion d'Honneur; a great success.

In 1887 he opened a branch of his firm in Moscow; in 1890 at Odessa, in 1903 in London and in 1905 in Kiev. Around 1900 the firm employed more than five hundred workers. However, the Moscow and Odessa branches were closed in 1918 together with the St. Petersburg parent company because of the Bolshevik Revolution: the Kiev branch had already closed in 1910 and the London branch in 1915 due to the First World War.

In addition to jewelry Fabergé's products included small items of furniture, all kinds of boxes, little animal sculptures in semiprecious materials decorated with gold and gems, various useful articles, frames, flowering branches in vases or baskets, clocks and mechanical

A beautiful belle époque pendant made by the Paris studio of Henri Vever (1901). It is made of gold with precious stones, enamels and a pearl (Schmuckmuseum, Pforzheim).

pieces. His most famous works are the jeweled eggs which were presented by the tsars to the tsarinas at Easter. The first of these was made in 1884 and was followed by about fifty others, the last being made in 1917. Each has a different theme either taken from nature or imaginative. Enamels were his particular speciality, above all the different finishes. Fabergé used a greater variety of precious and semiprecious stones than any other jeweler in history.

As far as stylistic derivations were concerned, Fabergé had a strong liking for the Louis XVI period and also the "old Russian style," which is a mixture of Byzantine and baroque, but there are also numerous works inspired by the Italian Renaissance, the rococo and the Middle Ages. His imagination was also captured by the fascination of the Far East, and its motifs often figure in his jewelry. He was a passionate collector of Japanese carved *netsuké*, and this reflected in the engraved stones, particularly those representing animals. At the beginning of the twentieth century he adapted the fashionable art nouveau ideas to his designs, reproducing its floral forms with exquisite elegance in many of his pieces. He always maintained the highest standards, and his eclecticism and versatility were always tempered by a rare combination of profound knowledge and understanding of form and balance.

Following the revolution Fabergé escaped to Switzerland where he died on 24 September 1920 at the Hotel Bellevue, La Rosiaz, near Lausanne.

The *belle époque* was a period of great economic expansion. The new wealthy aristocracy, who vied with the old nobility in their display of opulent luxury, favored such artistic-commercial organizations in the field of jewelry as that typified by Fabergé. While the products of these firms were always of the highest material and technical quality, from the aesthetic point of view they tended to reflect the taste of their bourgeois clientele which was usually conservative. Thus though the large firms were ready to make stylistic concessions to avant-garde ideas, they only absorbed as much as they felt their bourgeois clients could accept.

Louis François Cartier, succeeding his teacher Piccard in 1846, produced jewelry inspired by the eighteenth century. The prosperity and luxury of the Second Empire period favored the activity of the good jeweler of taste. Cartier came to the notice of the Empress Eugénie, who was particularly fond of jewelry inspired by the Louis XVI period, and he supplied her with this.

In 1872 his son Alfred joined him as collaborator and colleague, and the firm continued to prosper even after the founding of the Third Republic, as Paris remained the center of luxury.

In 1898 Alfred Cartier in partnership with his son Louis formed the company of A. Cartier et Fils, transferring their shop from the Boulevard des Italiens to its present address in Rue de la Paix. From that time one can distinguish the development of a certain kind of

design peculiar to Cartier, which involved for the first time the widespread use of platinum. Delicate settings, designed so that only the precious stones, which were among the very finest gems available, were visible, were made possible by the strength of this metal. Cartier became the most famous jeweler at the beginning of this century, serving the prince of Wales, the future Edward VII, the Brazilian royal family, the king of Portugal, the prince of Saxe-Coburg Gotha and the grand dukes of Russia.

In America around 1850 Charles Lewis Tiffany, father of Louis Comfort, was producing vases and silver objects in New York. He was the first to make wide use of the sterling alloy which was later recognized by federal government law. In 1866 he introduced the Tiffany setting which was a special fork for setting diamonds. Among his clients were President Lincoln and J. P. Morgan, and he made a silver mirror for Sarah Bernhardt's bicycle. The firm owns the Tiffany diamond, the largest and purest canary yellow diamond in the world, found at Kimberley, South Africa in 1878. In its natural state it weighed 287.42 carats. It was cut in Paris with the unusual number of ninety facets and was exhibited unmounted at two world exhibitions: Chicago in 1893, and New York in 1949.

The noted designer, Jean Schlumberger, of Alsatian origin, who had collaborated in designing costume jewelry for the famous couturier Schiaparelli in Paris, joined Tiffany's as a designer after the Second World War and recently became the firm's vice-president. He was the first jewelry designer to be awarded the Fashion Critics' Award at a ceremony at the Metropolitan Museum, New York. The Tiffany diamond has been set in a necklace designed by Schlumberger, which consists of a delicate tracery of knots with this exceptional diamond at the center.

In 1906 Julien, Louis and Charles Arpels and their brother-in-law, Alfred Van Cleef, descendants of generations of jewelers, founded their firm of Van Cleef and Arpels in Paris in the Place Vendôme. Within a few decades their choice jewelry had become world famous, and, in addition to the elegant tourist shops at the international resorts of Deauville, Cannes and Monte Carlo, they have opened branches in London, Geneva, New York and Palm Beach. Always abreast of the times, the firm has opened two boutiques in Paris and New York where jewelry of a more "accessible" kind is sold. Unlike other great firms, Van Cleef and Arpels keep the names of their important clients a secret; the sole exception to this was when they made the crown for the empress of Iran's coronation in 1967, the first empress of Iran in the thousand-year history of the country.

The firm's design for the crown was chosen by a special commission from fifty others submitted. The designer was not permitted to see beforehand any of the large number of jewels from the crown treasury which were to be used in the decoration of the crown. The sight

below Two Siberian snail shells, joined by a ribbon of diamonds, Carl Fabergé, c. 1890. bottom Cartier necklace of gold, brilliants and pearls, mounted on a black velvet ribbon. right A brooch in the shape of a bunch of grapes by Van Cleef and Arpels; it is made of gold, silver, brilliants and white and gray pearls.



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of the collection of jewels and precious stones from which the winners had to choose the ones they wanted for the crown must have been among the most exciting events in the jewelers' lives.

Pierre Arpels first chose the stone which was to be the centerpiece, a magnificent 150-carat emerald; then he chose the rest: 1,469 diamonds, 36 rubies, 36 emeralds and 105 pearls, in all 1,646 pieces. In the underground chamber of the National Bank of Iran where the treasure was kept the gems were arranged on a wax model of the crown. A cast of each stone was made in a special light metal so as to have the exact dimensions. A mount of gold and platinum was then prepared in the Paris laboratories and taken to Teheran where the stones were mounted. In all, this work took one year.

Boulgaris was the original name of the Roman jeweler Bulgari, whose ancestors were an ancient family of goldsmiths from Kallaritis, a mountainous region near the old Greek frontier. Sotirio Bulgari left his country as a youth and, after an unlucky sojourn in Naples, went to work in Rome in 1881. He had a hard struggle at the

beginning of his career as a goldsmith; however, through his skill and perseverance, he was finally able to open a shop at Trinità dei Monti and other branches followed. His chief activity was the production of beaten silver plate. From 1880 Sotirio, later joined by his sons, Constantine in 1889 and Giorgio in 1890, began to specialize in jewelry, closing the various branches and concentrating solely on the main shop in Via Condotti which was lavishly enlarged in 1934. In addition to the creation of modern jewelry for a very select Italian and international clientele, the firm keeps a splendid selection of antique silver, jewelry and high-quality jade.

Constantine Bulgari began an extensive and important study of researching and cataloguing Italian goldsmiths' work, accompanied by historical notes and reproductions of individual and state hallmarks. The series is called *Argentieri, Gemmari e Orafi d'Italia*. Bulgari's constructive interest, his cultural involvement in goldware and his enthusiastic work as a collector has put him in the front rank of great jewelers.

In addition to those mentioned, other firms of great

Bracelet in gold and precious stones, the clasp of which is held by two lions' heads, by Bulgari. This firm owns a magnificent collection of jewels, antique silver and high quality jade.

prestige maintain a constant high tradition of excellent quality; among them are Black, Starr and Frost of New York, founded in 1810 when the city had 175,000 inhabitants; Boucheron of Paris, founded in 1858; Patek Philippe of Geneva, who concentrated increasingly on refined jewelry; Harry Winston of New York, specialist in large stones; and in Italy Calderoni of Milan, founded in 1840, and Mario Buccellati, praised by Gabriele D'Annunzio.

The English painter and poet William Morris who considered the linking of functional and aesthetic considerations very important even in artifacts, founded the arts and crafts movement. Another man interested in the same ideas was the Belgian architect and designer Henry Clemens Van de Velde. He later designed the interior of the decorative art shop opened in 1896 by the Hamburg art merchant Siegfried Bing in Paris. It was called "Art Nouveau," which was, of course, how the French described the new ideas in the decorative arts and architecture. But even earlier the movement started by Morris and publicized by *The Studio* magazine was encouraged by another art dealer, Arthur Liberty, who displayed the new-style products in his shop.

In Germany the art magazine *Die Jugend* (which began publication in 1896) was the most enthusiastic propagator of the new trends, which became known in the German-speaking countries as the *Jugendstil*. In Italy it was called the Liberty style after the London shop; in France, *style 1900* and the modern style; in England, the Morris style and in Germany, *Lilien Stil*.

Jewelry lent itself very well to art nouveau treatment. There was now a reaction against old ideas and imitations of ancient styles. Art nouveau introduced many materials adapted to its symbolic or decorative ideas: bronze, glass, ivory and mother-of-pearl. The materials were not used for their intrinsic value but for their chromatic possibilities, and there was therefore a wide and refined use of enamels. In the early 1900s the jeweler Lucien Gaillard imported Japanese craftsmen from Tokyo who were experts in enamel work.

Flowers (particularly irises), thistles, full figures, busts or heads of women, peacocks, butterflies, serpents, Medusas and bats were the chief subjects which, with wide use of enamels and relatively few precious stones, were depicted by those imaginative artists who were orientated towards symbolism. In figurative work the pre-Raphaelite influence of Burne-Jones and Rossetti predominates, while in the abstract motifs and the designs of asymmetric and sculptured curves the influence of Celtic art and so-called auricula style of late eighteenth-century German goldsmiths is in evidence.

Horticultural motifs as well as naturalistic ones were inspired by the movements of sea algae and by two-dimensional patterns in Japanese graphic art. There was a predominance of wavy lines which gave rise to the expressions *style fouet* and *style nouilles*. Pastel blues and greens, milky, watery colors, stones such as opals, frightening animals like serpents, screech owls, vampires and bats and the figures of enigmatic, dreamy women of an idealized type occur in art nouveau work. The best examples can be compared with some of the most magnificent Renaissance pendants. From the arts and crafts movement it took only the innovatory urge and certain elements which lent themselves to its violent reaction from academicism. Its ideas centered on the instability of form and dynamism of line, accentuated by clear colors.

René Lalique (1860–1945), the Parisian goldsmith and jeweler, had the most profound influence on his contemporaries in Europe with works exhibited at the Salon du Champ Mars in 1895. He personified the art nouveau artist-jeweler. A corsage ornament made for Sarah Bernhardt consists of a long, flexible, stylized lizard with two enormous clawed feet, about to swallow a dragonfly in the form of a young woman whose nude body rises halfway out of the jaws of the horrible beast; in place of the woman's arms are long fine wings. Gold, enamels and chrysoprase are the materials out of which this large composition is made. Lalique achieved interesting color effects with engraved and satined glass in his exquisite jewels. From glass and enamel he made the bees on a hair ornament, which consists of a three-pronged branch, with a group of stylized flowers at the end of each branch from which the industrious insects are sucking the nectar (Musée des Arts Décoratifs, Paris). The serpent, with its complex contortions, was another of Lalique's principal themes.

The jewelers Georges Fouquet (1858–1929) and Henri Vever (1854–1942) differed from Lalique in that they expressed themselves in more synthetic and geometric forms. A pendant by Vever (Musée des Arts Décoratifs, Paris) shows the bust of a woman with long flowing hair wearing a diamond helmet and holding lilies in her hand. The design has a vaguely triangular shape, and the base is bordered with an abstract design in various colored enamels. This, together with another pendant called "Sylvia" which shows a woman in the form of a butterfly seen from behind, is most representative of Vever's work.

The Czechoslovak painter and graphic designer Alphonse Mucha (1860–1939), who worked in Paris, produced various jewelry designs, applying his lively talent for illustration to precious metals and gems. Many of his designs were used by Georges Fouquet.

Another talented artist of this period was Eugène Feuillâtre (1870–1916), who worked for a long time with Lalique and Lucien Gaillard who was mentioned earlier.

In Belgium Philippe Wolfers (1858–1929) excelled

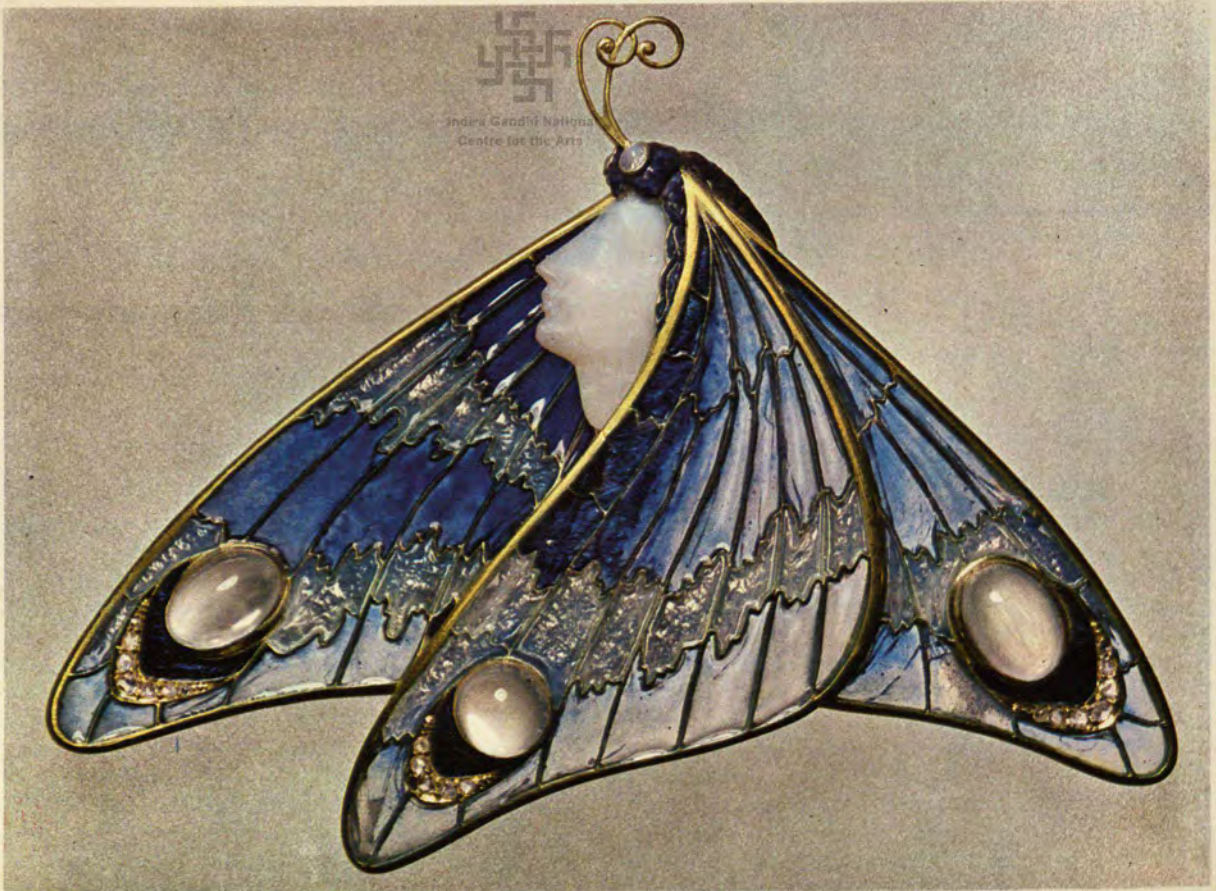
with his original designs, effective color schemes and delicate modeling. His compositions of animals and flowers are executed with a sense of balance and symmetry. He had great success with his exhibitions in Munich in 1899, in Turin in 1902 and at the Paris Salon in 1903. From 1905 he concentrated chiefly on sculpture.

The manifestations of art nouveau in France and Belgium, though only slightly different from each other in as much as they reflected the individual personalities of their creators, were quite different from the Sezession movement in German-speaking countries. In its chief centers at the beginning of the twentieth century, Vienna and Pforzheim, the more abstract aspects of art nouveau were in ascendancy; naturalistic motifs were abandoned for abstract and geometric ornamentation. Some of the decorative solutions and use of color which characterize the work of Gustav Klimt and Egon Schiele were in the Sezessionist style. A single pendant by Koloman Moser (Oesterreichisches Museum für Angewandte Kunst, Vienna) consists of irregular cabochon turquoises, corals, lapis lazuli, agate, amethysts, mother-of-pearl, moonstone, sapphires, emeralds, opals and amber set in an octagonal design. The

right *A pendant by René Lalique with the head of a woman carved in white stone, c. 1900. below Opal head of a woman enclosed between the wings of a butterfly, made from enamel and moonstones by Eugène Feuillâtre.*

eclectic architect, Joseph Hoffman, founder of the Oesterreichische Werkbund in 1912, also designed magnificent jewelry.

In the United States art nouveau found in Louis Comfort Tiffany (1848–1933) one of its most individual interpreters. Tiffany was the greatest American decorator of his time. He started as a painter, but his lively interest in all branches of the decorative arts, from wrought iron to embroidery, and from stained glass to mosaic furniture, resulted in all sorts of large-scale artistic undertakings. His most important contributions were the vases in his new oxidized iridescent glass, which he made in flowing shapes designed with great technical skill. In his jewelry Tiffany was at first fascinated by oriental and Byzantine ideas and colors, which he adapted to art nouveau forms; later he became interested in Lalique's French symbolism, imbuing it with his own personal style; and finally a necklace in the







Sarah Bernhardt's bracelet and ring by Georges Fouquet, from a design by Mucha. right Oval brooch by Boucheron, triangular brooch by G. Fouquet (1925), and platinum brooch by Raymond Templier (1925).

Metropolitan Museum, New York, expresses with exquisite grace the Sezessionist style.

The different characteristics of jewelry in the Sezessionist style vary from abstract designs, which achieved greater popularity in Scandinavian countries, to aesthetic shapes which preceded those that influenced the decorative art creations displayed at the famous Paris Exhibition in 1925. These aesthetic tendencies, based on the theory of "pure visibility" found a satisfactory means of expression in the decorative arts, from the graphic arts to stage design.

Cubism, futurism, Mondrian's abstracts and the De Stijl group, the pictures of Klee and above all the work of the Bauhaus school, which attempted to "re-establish the unity and harmony between the diverse branches of the arts," influenced avant-garde jewelry. There was considerable collaboration between artists and craftsmen and by great artistic-industrial firms of the kind mentioned above.

As with art nouveau jewelry, in art déco works of the 1920s the materials chosen were adapted to express the new stylistic language. The compositions were based chiefly on the play of geometric forms; smooth, polished or satinized surfaces were preferred for precious metals, especially platinum; diamonds or other precious stones tended to be restricted and used in *pavé*. Lacquer was used to color surface designs. For their colorful effects coral and diamonds, onyx and emeralds or rock crystal and red gold would appear together in one piece of jewelry; difference in the actual value of the different stones did not prevent them being mixed. The sole aim was to create something which answered the aesthetic requirements of the nonfigurative styles in fashion.

In my opinion the three progenitors of art déco in jewelry are: Georges Fouquet (1872-1957), Jean Dunand (1877-1942) and Jean Després (born 1889).

Fouquet was the oldest and had already distinguished himself during the art nouveau period which was completely over by the 1914-18 war. In 1925, when he was sixty-three, he created new jewelry designs which were young in spirit, with an accomplished technical and chromatic discipline, only a few of which echoed the now hated art nouveau style. A good example is a *broche* consisting of a lightly modeled green jade mask with onyx eyes and a kind of tricorner hat, which is also in onyx. Diamonds in *pavé* surround the eyes and embellish the hat, from which hang two large jade spheres, one on each side, and five small spherical pendants are suspended from these in symmetry with the central one. The predominant color of the jade is enormously enriched by the *pavé* border of diamonds and the black onyx which give the jewel an immensely elegant appearance.



A more up-to-date idea is realized in another *broche* which consists of an onyx disc, the upper central part of which has been modified to hold part of a coral sphere. The disc is decorated with platinum molding which extends below the disc at the bottom edge. This is covered with bands of diamonds, the central ones being vertical and the horizontal ones stretching out towards the edge of the disc, giving the general effect of an extremely geometric body. The jewel ends with a large drop-shaped coral.

Jean Dunnand left Ghent in Belgium when he was twenty, and went to Paris. He made other decorative art objects besides jewelry, specializing in metal and ambient decorations. His jewelry was influenced by Mondrian's style: smooth silver surfaces sectioned into fine openwork or backed squares, some lacquered in red or black, or other geometric surfaces where the metal is lacquered with triangles or rhombs; two-dimensional jewels whose lines are defined by the angles of adjacent geometric figures.

Jean Desprès is also an almost pure geometrician. In a rigid, perfectly circular necklace of gold and silver, the semicircle at the front is tubular and encased in rings and wide bands, sectioned and spanned by carvings in relief. There is a sphere at each of the truncated ends of this semicircle which is hinged to the second semicircle made

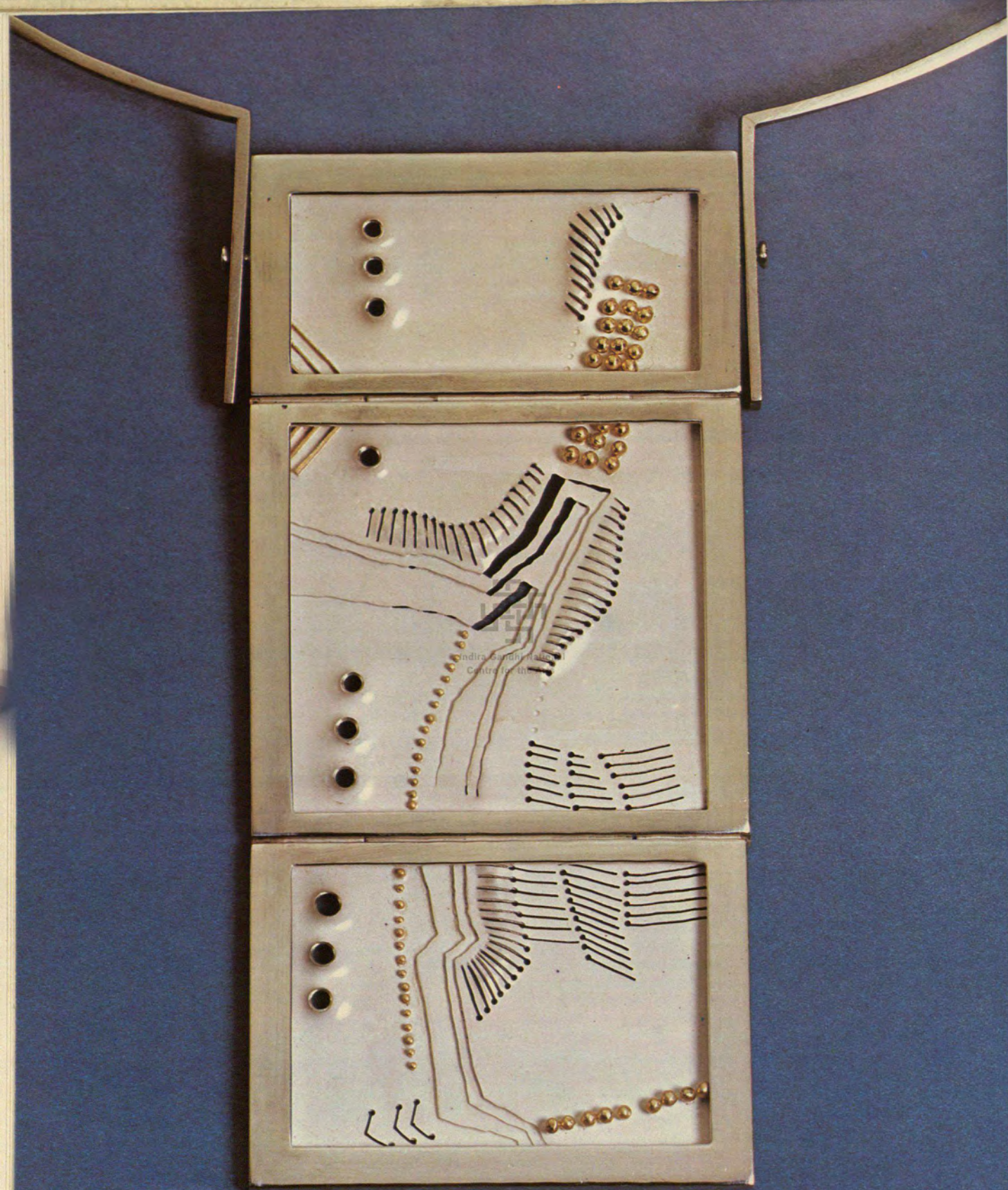
up of two connected bands. It is basically an interpretation of the torque, but with avant-garde improvisations. A ring by Desprès consists of a composition of large geometric solids, some of which have been lacquered. This piece of jewelry could easily have been designed by a contemporary artist-jeweler.

Sons often follow in their father's footsteps like Jean, Georges Fouquet's son. His jewelry is characteristic of geometrization, but consists of asymmetrical cadences of remarkable beauty. To achieve a refined effect he would use golds of different colors, unusual semiprecious stones and lacquer.

Gérard Sandoz the Younger, who was born in 1902, also exhibited his work at the 1925 Paris exhibition. Geometrization in his pendants was slightly softened by a somewhat complex architectural pattern. This was combined with artificial mechanisms such as wheels, discs, flat surfaces and niches, all of which were in perfect symmetry, and sometimes had superimposed elements. He used white and red gold alloys, matt and shiny finishes and semiprecious stones.

Jewelers such as Raymond Tempplier and René Robert in France, H. G. Murphy in England and Wiwen Nilsson in Sweden all participated in this craze for geometrization.

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Jewelry and avant-garde ornaments: the expressions of contemporary artist-jewelers

After the Second World War artists of international fame devoted some of their time to creating jewelry. In most cases, however, the artist expressed himself by transferring miniature paintings or sculptures to precious metals. Some of them merely designed jewelry such as Braque, Cocteau, Max Ernst, Arp, Dali, Tanguy, Dubuffet and, to some extent, Man Ray. Others, however, constructed their own jewelry like Picasso, Afro, Derain, Calder, Giacometti, Fontana and others.

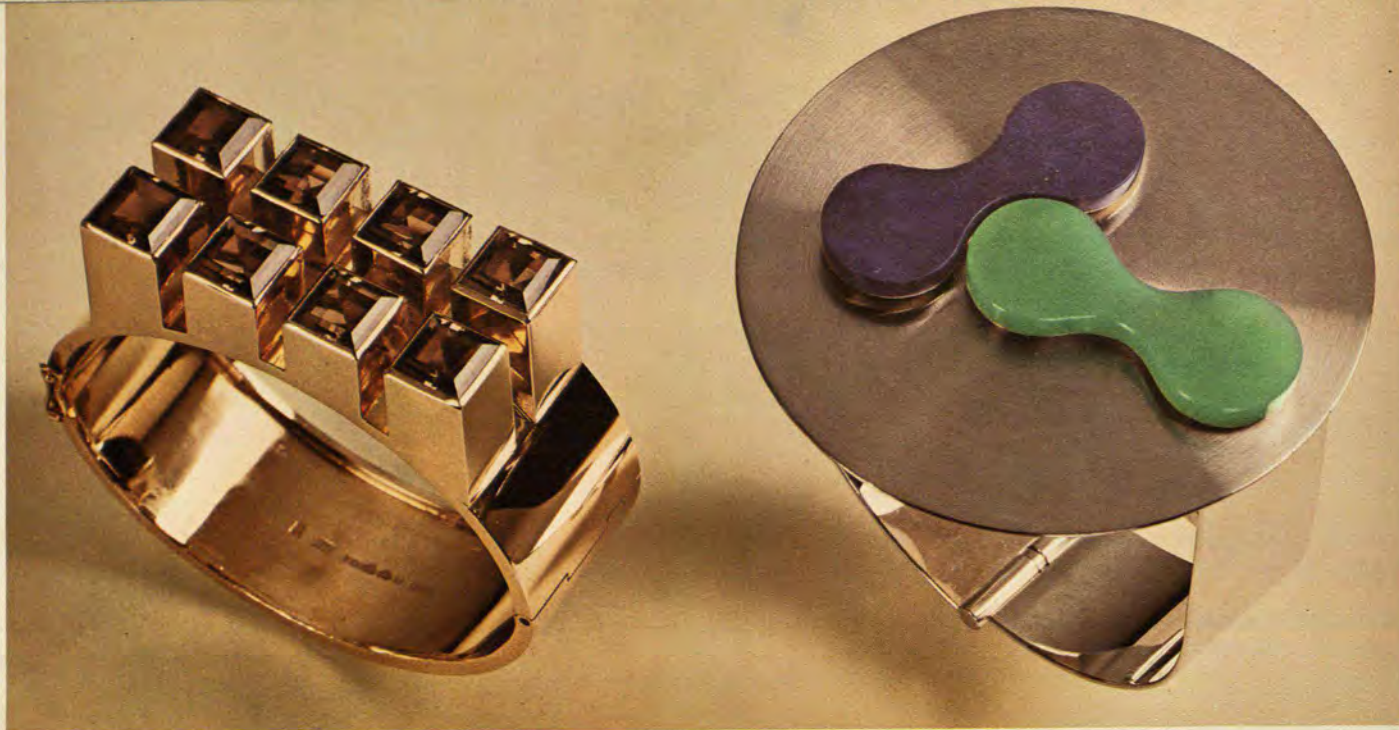
Other gifted artists, while maintaining their own styles, have succeeded in creating jewelry with a certain appreciation of value which is the essence of jewel making. Schlumberger, Fulco della Verdura, Jean Lurçat, Gilbert Albert and Andrew Grima who work in Paris, New York and Geneva with important firms like Tiffany, Patek Philippe, Omega, Cartier, Van Cleef and Arpels, Boucheron, Winston and others are gifted in this way. Artist-jewelers who design jewelry which is to be produced in limited numbers can have it made at specialized laboratories such as Gem Montebello in Milan and Sculptures to Wear in New York.

There are, therefore, those artists who dedicate some or much of their time periodically to jewelry creation while others concentrate exclusively on this art. Mass production of their work can be carried out either by specialized art galleries or qualified laboratories.

In contemporary jewelry, in addition to the traditional materials, a wide variety of new ones such as perspex, acrylic products, brass, steel, anodized aluminum, polystyrol compounds, terylene, glass fiber, polyester resins, leather and curios are now also being used. Traditional metals undergo special treatments in electrolytic baths and unconventional fusing, and semiprecious stones are frequently set as natural crystals which have hardly been cut at all. Some jewels, or rather avant-garde objects, consist of non-precious material, but this makes them no less interesting from an experimental point of view.

Although there are many stylistic trends, there are not as many as there might seem from a preliminary examination. With a few exceptions they relate to the current artistic drifts which distinguish the figurative arts and are, in fact, products of figurative art in the real sense of the word as they are lacking in decorative elements. Suffice it to say that if it were possible to encompass the means of expression of a group of artists, each one would have his own personal method of communication.

The affinity that exists between the means of expression of contemporary art and modern jewelry designed by artists can be seen in this gold and silver pendant for a necklace by Jens Rüdiger Lorenzen, 1971 (Schmuckmuseum, Pforzheim).



Nowadays it does not make sense to classify the art of jewelry production by the place of origin or the jeweler's residence. From Australia to America artists produce work according to the trend with which they identify themselves, and are no longer influenced by local characteristics. Consequently their jewelry can only be established as part of the boundless culture which is now generally acceptable to everyone. The outcome of this phenomenon is that future generations will have to delve into ancient traditions.

Among the artist-jewelers who have been inspired by a certain classicism are: Sigurt Persson, a Swedish designer, who through the curve variations in his jewelry achieves an almost primordial expression; Bruno Martinazzi, an Italian artist-sculptor whose great sculptures have won him international renown, and who portrays with pulsating vitality and vividness eyes, hands, mouths and torsos; from a stylistic point of view he is a unique artist. Bianca Eshel-Gershuni from Bulgaria individualizes her floral compositions by the inclusion of coral, jade and turquoise; Mario Pinton from Italy has achieved international recognition for his elongated designs in *repoussé* on gold plate, inspired by the pre-Hellenistic period; Anton Frühauf, who also comes from Italy, has modified ancient Greek motifs in his jewelry with great sensitivity; Nevin Holmes of Great Britain is noted for having introduced the most fabulous architectural aspects into his rings.

Among the chief exponents of surrealistic art are: Arline Fish of America whose harmonious lines expertly embrace nudes and heads in symbolic forms; Hubertus von Skal (a Czechoslovak resident of Munich) places tiny men in suits and hats inside large cubes or on

earlobes. In the field of hyperrealism, John Plenderleith from Great Britain immediately springs to mind: one of his compositions, for example, shows a half-squeezed tube of toothpaste with the toothpaste coming out and spreading onto a toothbrush, or a cup of coffee on a saucer; Karel Niehorster from Holland has designed an unusual brooch consisting of a zip fastener from a leather folder.

However, most contemporary jewelry designed by artists is based on abstract art. Compositions of square or round panels with a flat, uniform surface, small symbols, bands, holes, lines, tiny spheres and repeated geometric patterns frequently occur, as in the work of the Japanese artist Hirosh Iguchi. Lattice work and inscriptions in capital letters are used by the Dutch artist Robert Smit; concentric circles and compositive themes are favored by Kultakeskus from Finland; while superimposed plastic shapes or regularly arranged oblongs are featured in the work of Claus Bury of Germany. The multicolored compositions of Gerda Flöckinger, who is an Austrian resident in Great Britain, are justly considered to be among the best examples of "new creativity." The Victoria and Albert Museum exhibited her work in 1969 and she also exhibited with the English artists Louis Osman, Charlotte de Syllas and John Donald at the National Museum of Wales. Gold openwork panels, characterized by a harmonious succession of irregular shapes side by side, belong to another phase of Anton Frühauf's work. The following names should be mentioned in connection with abstract compositions of figurative art: Anton Cepka from Czechoslovakia is famous for his essentiality of line and color; Ulrich Klaus from Germany is also noted for this, but his

left Two bracelets, one in gold and quartz by Sigurd Persson (1963) and the other in white gold with lapis lazuli and chrysoprase by Friedrich Becker (1969).



compositions are even richer in color; Othmar Zschaler from Switzerland, with his inexhaustible imagination, achieves certain valuable effects which do not repudiate the manufacture of jewelry; Reinhold Reiling of Germany, who is rightly considered to be a master, inserts the leitmotif of a woman's profile and sometimes even a photograph in the abstract or geometric framework of his pieces; an even greater expression of plasticity on irregular surfaces is printed upon precious metal shown by Georg Seibert, a Yugoslav working in Berlin, Karl Heinz Reister, a German working in Milan, and the Czechoslovak, Nováková.

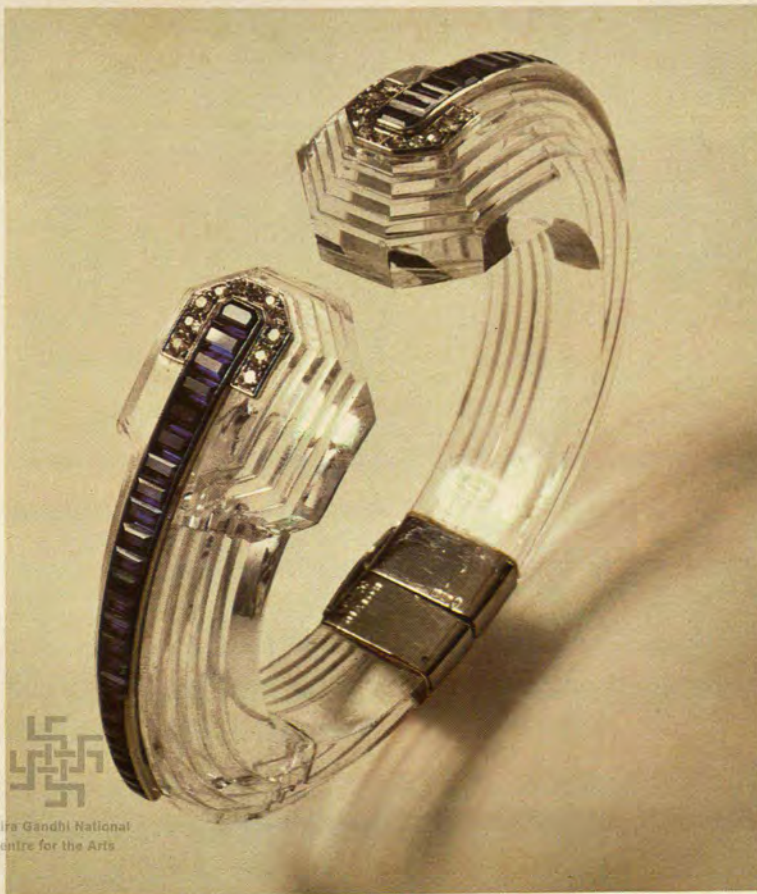
The tormented abstractism of Hermann Jünger of Germany often expresses itself in conjunction with reality and asymmetrical designs. In one of his pendants which he made in 1970 the purity of the composition and the strict balance of draftsmanship and color are reminiscent of certain futuristic interpretations by Gérard Sandoz in 1928.

The panels by the German artist, Gerd Rothmann, which are used for buckles, pendants and bracelets, are frequently made exclusively of gold and steel and have been inspired by the culture of the Far East.

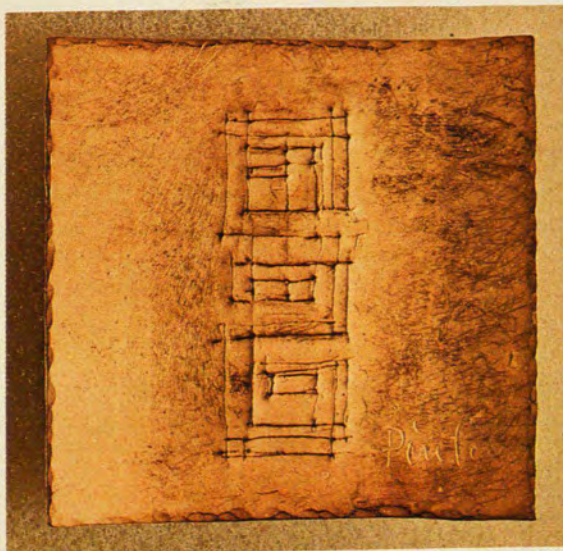
Rüdiger Lorenzen from Germany decorates plaques with holes of different sizes or schematic and geometric reliefs.

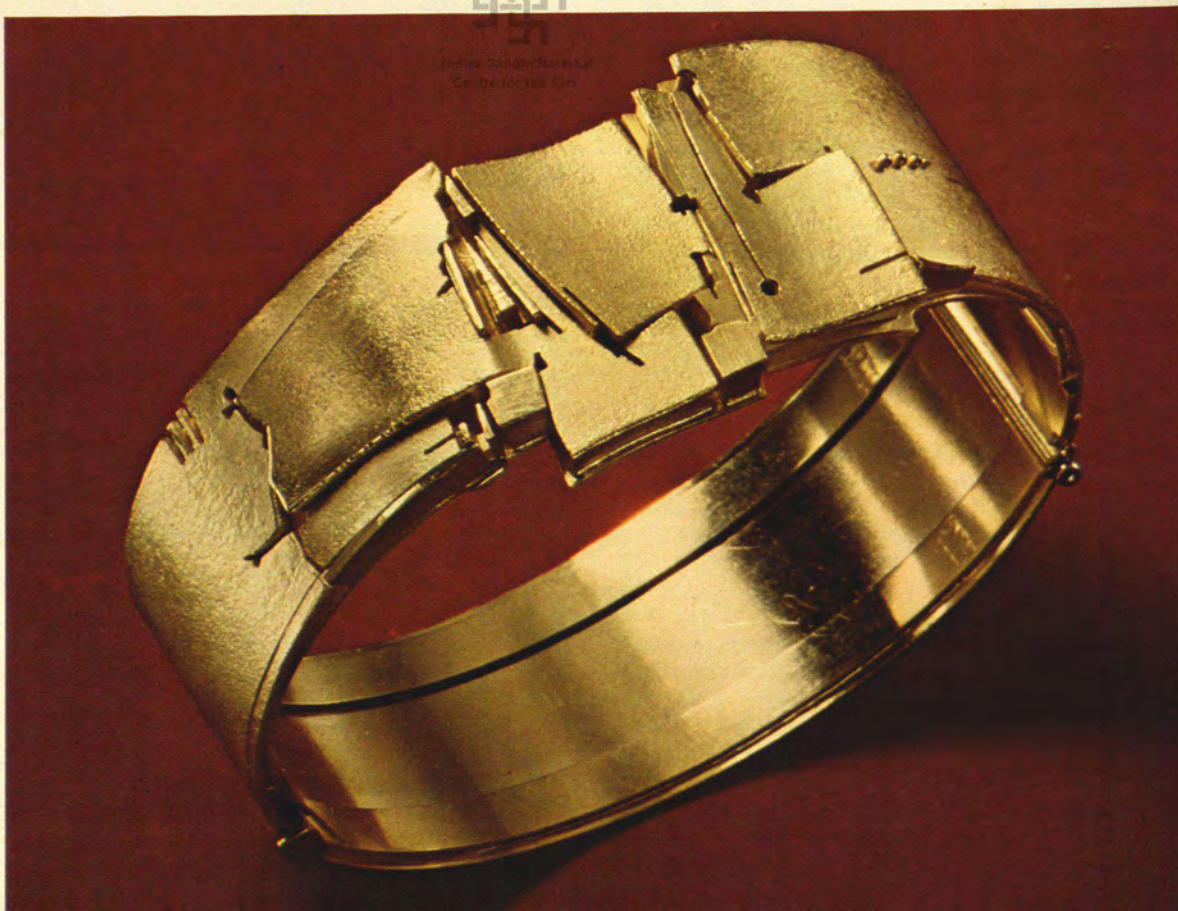
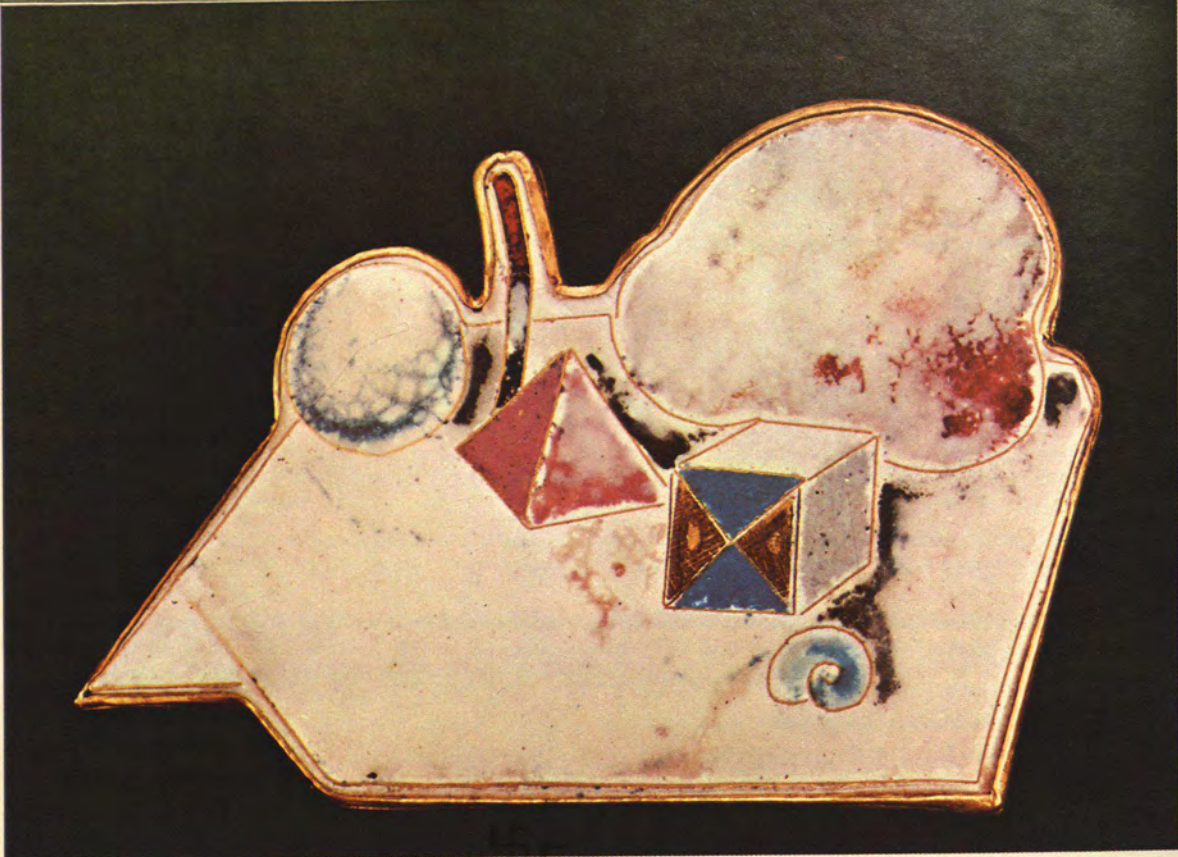
Pietro Gentili from Italy likes to express himself with rounded, superimposed shapes worked in relief and stamped and engraved like mysterious, enigmatic amulets.

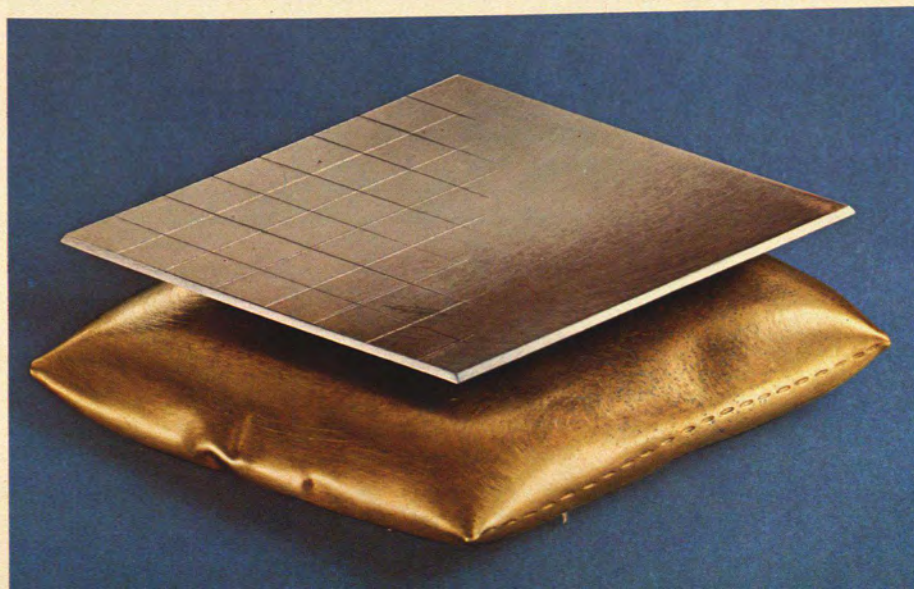
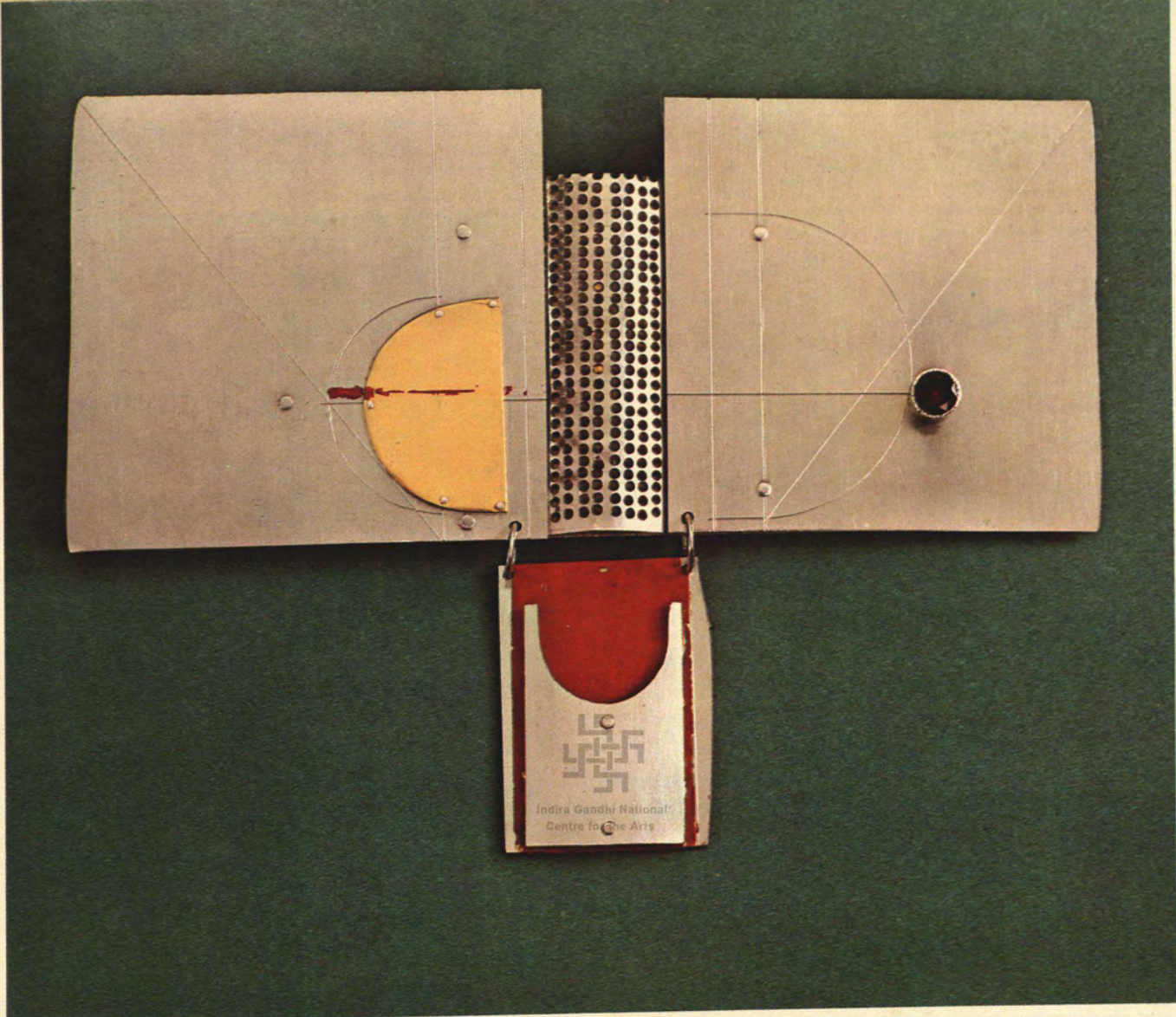
Yasuki Hiromatsu, a goldwork tutor at Tokyo University, is one of the few designers who, while adhering strictly to abstract art, also expresses himself in



Bracelet in rock crystal, platinum, sapphires and diamonds by René Boivin's studio, Paris (1925-7). below A jewel by Mario Pinton. above left by Martinazzi.







Silver brooch by Anton Cepka, Bratislava, 1970. left Brooch in steel and gilded copper by Gerhard Rothmann, 1975. opposite above Gold, silver and enamel brooch by Hermann Jünger, 1974. opposite below Gold bracelet by Othmar Zschaler, 1976.



Gold bracelet with cabochon emeralds by Jacqueline Stierer, 1973. below A jewel by Arnaldo Pomodoro who, together with his brother Giò, introduced into the art of goldwork new forms inspired by mechanical elements.



the language of his native country.

The Italian brothers Giò and Arnaldo Pomodoro excelled in creating jewelry of aesthetic utility, inspired by machines or machine parts. Arnaldo was especially gifted, but recently decided to give up jewelry in order to concentrate on sculpture. By 1958 these two artists had already become internationally famous for their fascinating jewelry-sculptures. In 1963 Arnaldo introduced polished spheres, which had been defaced by telluric fragments, into his necklaces. Later discs, shanks and cogged wheels constituted the progressive and refined theme in his jewelry.

Mechanical elements with misleading variegations of heads, screws and rounded insulators, invade some of Claus Bury's work. Fritz Maierhofer from Austria follows the same theme, but uses more color while Frank Bauer from Australia makes the bolts in his jewelry adjustable.

The most significant jewelry created by Pietro Consagra, an Italian sculptor, is inspired by Cufic lettering with which he decorates a succession of flat shapes.

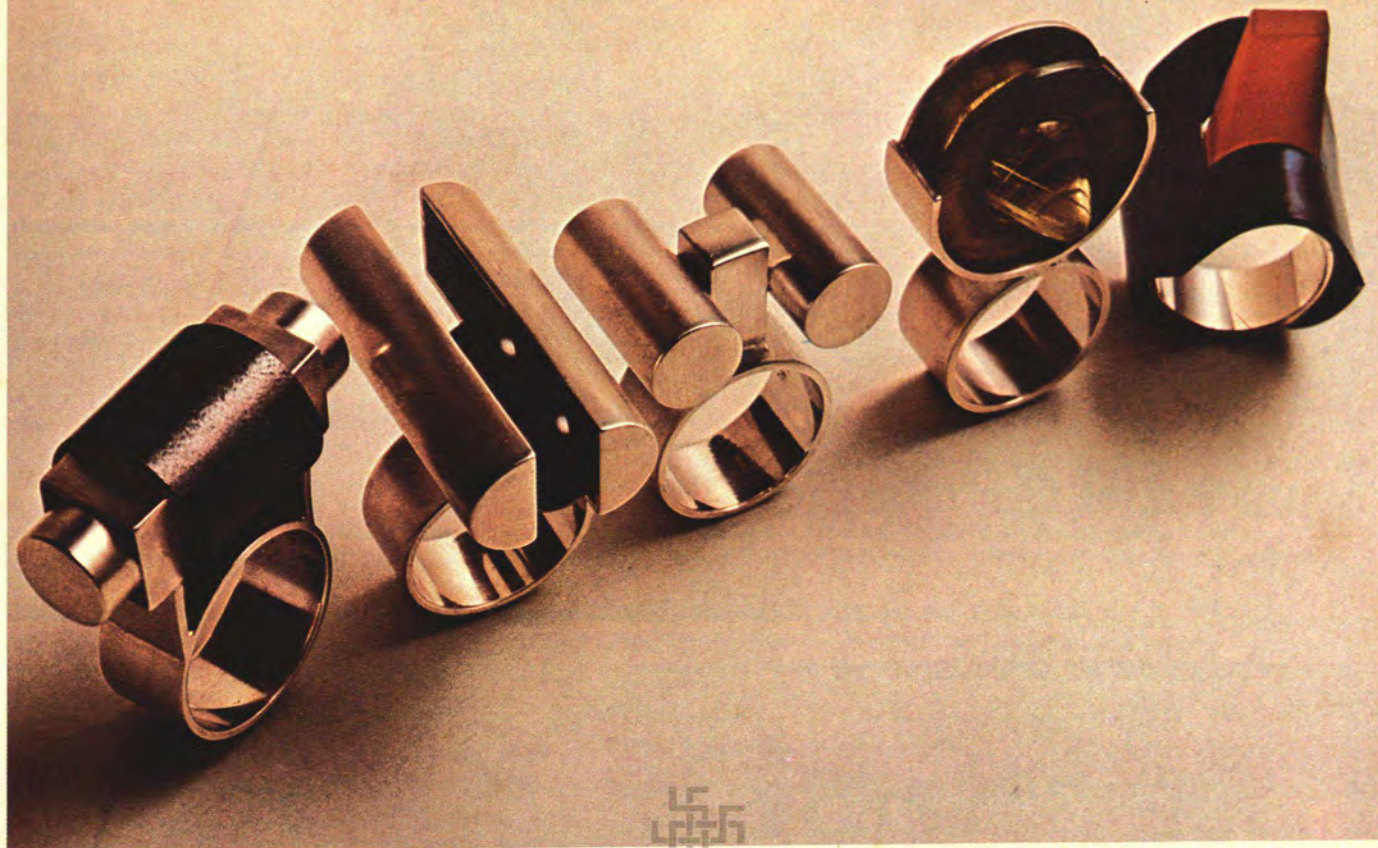
The jewelry produced by Kodré-Defner, an Austrian couple, could be defined as molded gold sheaths from which small clusters of colored stones and pearls unexpectedly overflow.

Without wanting to classify the artistic trends of this vast new activity, whose creativity always reflects the individual personality of the artist, it is interesting to note that the evolution of culture, science and techniques has, as always, influenced jewelers. Some apply the norms of kinetic art, which uses movement as a means of expression, in direct contrast to the artistic object in a static form. With extensive use of acrylics, precious stones and silver, Gunilla Treen from England sets patterns of circles, discs, triangles and spheres in a transparent block, which change position as the object moves, causing informal compositions on a refined chromatic background.

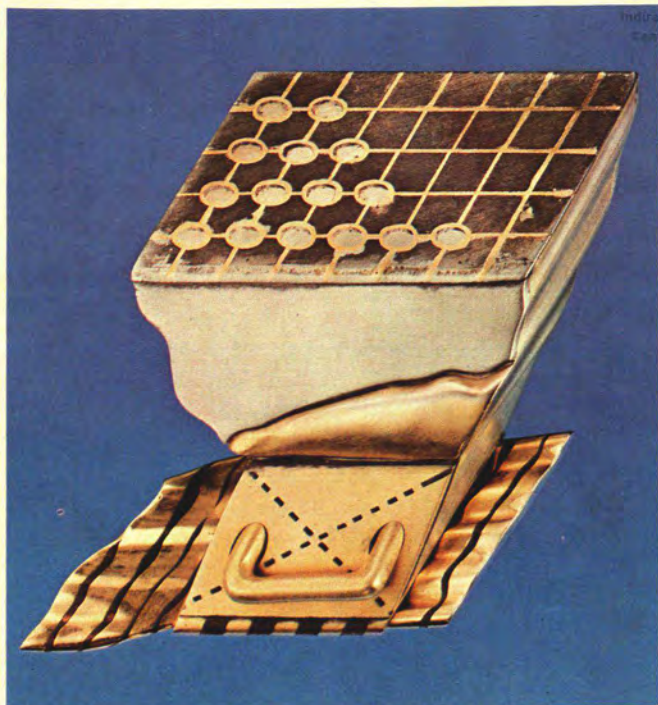
One of the major exponents of kinetic art in jewelry is Friedrich Becker from Germany. His expression consists of constellations and flat surfaces on which cylindrical, spherical and pyramidal shapes lend a new, increasingly dynamic and luminous appearance to his creations. Significant recognition of Becker's art began in 1961 with the exhibition of his work held at Goldsmiths' Hall, London.

For some years the artist-jeweler's creations have been enormously enriched in color due to the use of acrylic substances which tend to polymerize in the light, forming solid, fragile or inalterable conglomerates. The Englishman David Watkins uses this technique extensively on silver, obtaining excellent linear and polychrome effects.

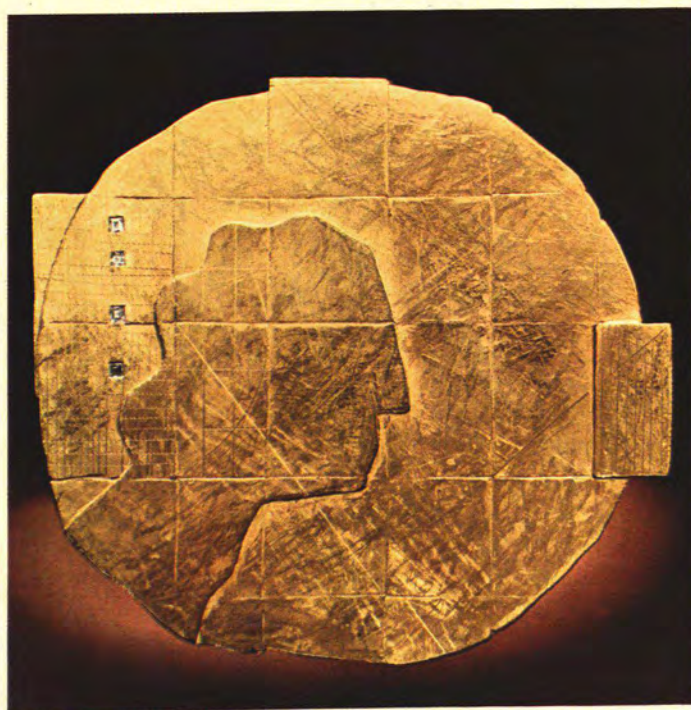
Resins, enamels and lacquers are used in addition to acrylics by Cepka, Bury, Smit, Jünger, Lucio del Pezzo from Italy, Niki de Saint Phalle from France, and Roger

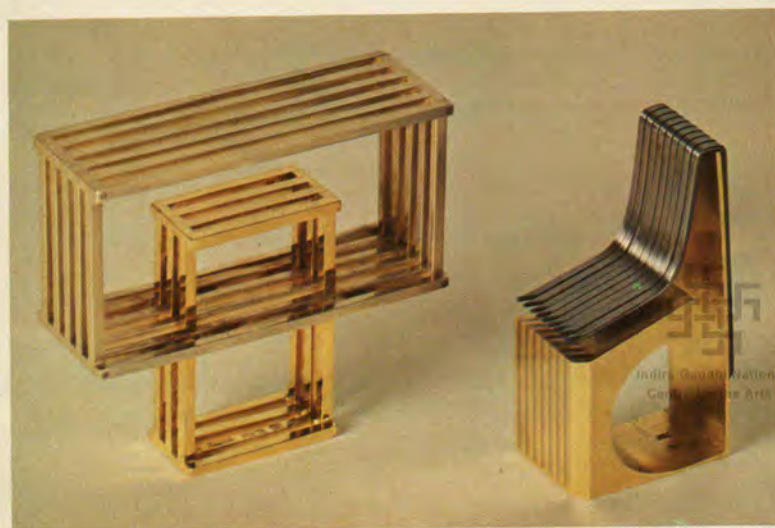


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Other examples of the numerous aspects of contemporary jewelry : below
A brooch in gold and diamonds by Reinhold Reiling (1970) and (above)
abstract rings in silver and titanium by Emanuel Raft.



A gold and silver brooch by Claus Bury (Hanau 1974), an artist whose work was also inspired by mechanical elements, but with misleading variegations.





top Gold and tourmaline rings by Gerda Flöckinger. above Two unusual but strictly symmetrical rings by Yasuki Hiramatsu (in gold, 1973) and Norbert Mürrle (in gold and steel, 1974). right Silver and turquoise bracelet by Louis Osman.

Morris, Joe Tilson and Susanna Heron from Great Britain.

Some artist-jewelers like Wendy Ramshaw from England delight in one particular means of expression. In her vast collection of rings she features skittles of all shapes, molded in gold and partially colored with enamel, which rise up in place of the bezel. The shanks of these rings are equally elaborate and constitute aesthetically valuable works in themselves.

Bod Ebendorf from America has designed a somewhat pioneeristic *broche* consisting of a watch dial with a centimetered ring carrying a central medallion with a nineteenth-century photograph of a man on zinc; the rest of the body, which is seated, is continued in a rectangle below the dial, and there is a large bee between the man's legs. The inclusion of photographs on zinc or silver is frequent in certain modern American jewelry

created by the "Pepsi generation."

Gold, which has been especially treated so that its surface becomes rough or spongy, resembling a rock which has been badly eroded by water, is another feature. Reinhold Krause from Germany uses it in his brooches, rings and rigid necklaces. However, another German, Ebbe Weiss-Weingart, who is an artist of international fame gifted with a rare sensitivity and temperament, was the first person to use it, even though she used other techniques to obtain this effect. Stanley Lechtzin from America uses the same technique in his jewelry, but the general appearance of his work is more oppressive and baroque.

The German artist Norbert Mürrle uses a couple of oxen as his principal subject, one entering and one leaving a background of gold – a field of long grass – flanked by chromatic contrasts in the form of a keyboard.

The Belgian sculptor, Emile Soupy, has extracted his style in jewelry from his sculpture. His expression has undergone various changes and his most recent work (the Mercedes pendant, 1973) seems to be orientated towards pop art.

The sculptress Irena Brynner, who is a tutor in jewelry at the Institute of Modern Art, which is affiliated to the Museum of Modern Art in New York, started making jewelry in 1950. Her designs usually relate to sculptural abstractism.

An exhibition of erotic jewelry, specializing in contemporary avant-garde works, was held at the Electrum Gallery in London in 1971. Among the exhibitors were Hubertus von Skal with his humorous phallic portrayals, Patricia Tormey depicted groups of nude figures in erotic positions, and Ed Samuels modeled frontal and rear views of nude human figures, but with a less deft hand than Martinazzi.

Great Britain and Germany are the most important European centers for the diffusion of contemporary jewelry by artists.

The Worshipful Company of Goldsmiths in London, founded over eight centuries ago, boasts a glorious and uninterrupted history which can be matched by no other institution in the world. Since the thirteenth century it has always been based in the same building, which was renovated in 1835. It owns a large and famous collection of antique gold and silverware, and the current art director, Graham Hughes, who is himself a jewelry historian, was the initiator, and continues to encourage, an intense activity in the field of artists' jewelry. Since 1961 the institute has frequently held exhibitions for the most qualified artist-jewelers such as Martinazzi, Becher, Osman, Persson, Brynner, Abend, Lechtzin, Ramshaw and Watkins, who were mentioned earlier.

The Victoria and Albert Museum in London also has one of the largest collections of antique jewelry which is on display in specially fitted rooms. In the course of several exhibitions held in 1969, which featured the

work of the most prominent contemporary exponents of the decorative arts, the museum acquired some of Gerda Flöckinger's jewelry.

Phorzheim is a small town on the edge of the Black Forest in Germany. Like Valenza Po in Italy, most of its population is involved in the production of goldwork and jewelry. The Schmuckmuseum, which is the only jewelry museum in the world, is situated there and houses a large and priceless collection of jewels. The collection was donated to the town and includes pieces which date from the pharaohs to the nineteenth century. The museum was built after the Second World War with an annexe containing a public library. Under the auspices of the vigorous curator, Fritz Falk, the museum has become an international nucleus for the diffusion of information on modern and contemporary artist-jewelers' works, of which the museum itself is making an opulent collection. The life of the institute revolves around important personal and collective exhibitions like the bi-annual "Tendenzen" where works by famous artists are displayed, international competitions organized and the relative publications issued.

In the United States and Canada many modern art and contemporary handicraft museums organize extensive activities in the field of jewelry as there is no specialized institute. The same thing happens in Holland where contemporary jewelry is encouraged by the government.

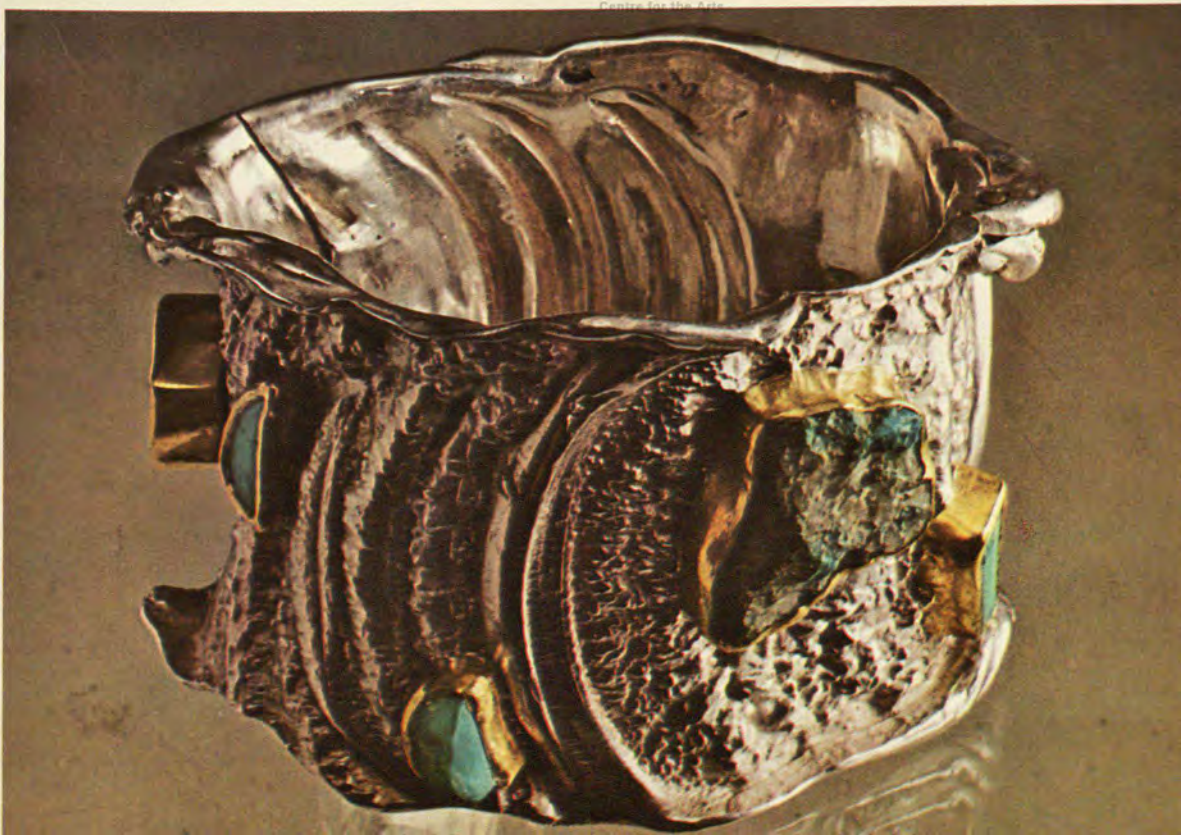
Two of the major art exhibitions in Italy, the Venice Biennale and the Milan exhibition held every three years, have made room for new jewelry creations, inviting

foreign artists of international renown to participate.

In 1972 the first bi-annual market-show, "Aurea," took place at Palazzo Strozzi, Florence, under the patronage of the local authorities. The organizers' intention was to "revive in a modern spirit" and perpetuate the tradition of Florentine goldwork. Besides their desire for commercial publicity they also wanted, more nobly, to "investigate the expressions of contemporary art and check in what measure pure commercialism outweighed creativity and invention" (Ugo Ziletti's introduction to the first catalogue). The organization also drew attention to the need for promoting competitions, studies and technical exercises which could be offered to young people wishing to involve themselves in jewelry creation.

Since 1953 De Beers Consolidated Mines Ltd. have sponsored the annual "Diamond International Award." Over a thousand contestants from all over the world take part, of which thirty receive prizes for having used in their work 60 percent of the value of their materials in diamonds. In spite of this stipulation, this stimulating competition has attracted many famous artist-jewelers who have been mentioned in this chapter, like Andrew Grima, who was one of the winners in 1966 and 1968, Georg Jansen in 1969, Elisabetta Kodré-Defner in 1970, Irena Brynner in 1971, Norbert Mürrle in 1974 and Wendy Ramshaw in 1975. Germany has had the greatest number of winners, followed by Japan, just ahead of England. Switzerland, the United States, Italy and France are next in order of merit.

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China in the Sung period and jewels from the Far East

China, which has a very ancient artistic tradition, began to use precious metals relatively late. Gold, like silver, was used in the most ancient times in the form of inlay on bronze objects. Some rare references to personal ornaments date from the T'ang period (618-907), but it was only with the beginning of the Sung period (960-1279) that the Chinese showed any great interest in jewelry.

Only towards the end of the first millennium AD did the assimilated methods and techniques from countries that were more advanced in the working of precious metals begin to manifest local characteristics, realized with delicate skill. From the late Sung period onwards jewelry forms tended to remain static or repeat themselves, with only slight variations as the country's more developed social classes clung to ancient traditions in every field of art.

In the most ancient pieces (hairpins, necklace beads, combs) very delicate use has been made of gold with openwork filigree, granulation and relief work while on jade very fine bas-relief carving has been skillfully executed. Repeated scroll and floral motifs and human figures were the most popular designs. Later embellishments became richer and included the setting of precious stones, especially turquoises, coral, jade and pearls. The decorative themes mostly concern animals (dragons, birds, particularly the phoenix) and other symbols of good luck such as clouds, flowers (the lotus), branches, leaves, and geometric designs made from bamboo.

The most important type of jewel was traditionally worn on the head and could vary from a plain diadem to an elaborate tiara; in the most ancient examples of religious sculpture the decorations of these bear a close relationship with Indian jewelry of the time.

However, the symbols represented in Chinese

Chinese belt ornaments in jade: above Two interlocking elements in a pale whitish-green jade carved with dragons, Ch'ing dynasty, eighteenth century; center left Green jade plaque with oval slit, Ming dynasty, fifteenth to sixteenth century; center right Gray jade plaque with two dragons and a central hole, early Ming dynasty, fourteenth to fifteenth century; below Green jade ornament with two lotus leaves, late Ming dynasty, sixteenth to seventeenth century (British Museum, London).

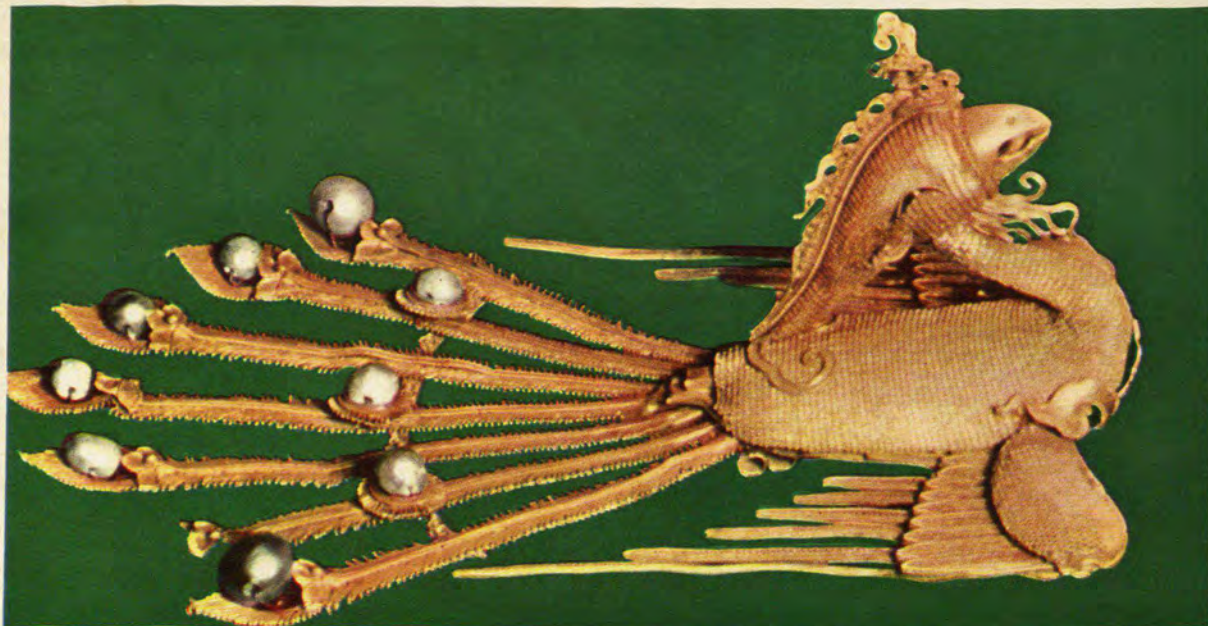
ornaments are different from those used in southeast Asia, as is the texture of the works. Necklaces are very heavy, often embellished with two or three central motifs, mounted with large cabochon gems and pearls and richly ornamented with tracery and volutes. Less ancient necklaces are often lighter, being composed of rows of pearls and precious stones arranged in garlands, with rich embellishments at the points of contact and drop pearls hanging below. A secondary type of necklace was often worn across the stomach reaching as far as the thigh and winding round across the spine. It consisted of engraved and jeweled gold pieces, with a medallion decorated with relief and filigree and a huge gem in the center, suspended from the crossing point. During the T'ang dynasty rigid tubular necklaces which narrowed at the clasp were frequently worn. Some statues of Bodhisattva wear armbands and bracelets bordered with stones and pearls from which richly worked medallions hang.

A gold breastplate, which is thought to have belonged to a fifteenth-century emperor, and now in the British Museum, is copied from a type which was certainly much older and shows ancient Iranian influences. On a rectangular gold sheet bordered with a double row of bezels set with various uncut precious and semiprecious stones is a scene depicting two dragons engaged in a lively struggle on a background of pierced-work clouds scattered with gems. The *repoussé* work reveals a surprising naturalism and the pierced work looks like an elaborate cobweb.

Tiaras, diadems and small decorated combs were widely used by ladies of high rank, both in and outside



Flexible neck ornament inlaid with coral, Tibetan. below Hair ornament in the shape of a phoenix, Chinese, Sung dynasty (960-1279). right Bird-shaped jewel made of pearls, jade and feathers, Chinese, eighteenth century.





the court circle. Their size and richness of decoration depended upon the wearer's social status. Headdresses were long, with four elaborate pendants hanging from the highest and most prominent point and falling two on each side of the head. The pendants usually consisted of strings of pearls interspersed with decorated gold plates and finished off with a colored stone. If earrings were worn with a rich headdress, they would match it. Tiaras, hairpins and gold earrings with S-shaped clasps from which hung a relief composition, such as a phoenix

surrounded by flowers, completed the head decoration.

Buckles for belts were made of a large piece of jade engraved with floral motifs.

Bracelets were rigid like torques. They usually consisted of a fairly thin band of gold decorated with relief designs.

In China, like Iran, the noble archers wore a ring on the thumb which was especially shaped to bend the bow.

A tradition found only in Chinese jewelry was the use of the breast feathers of a rare sea bird (*Fei T'sui*), a type

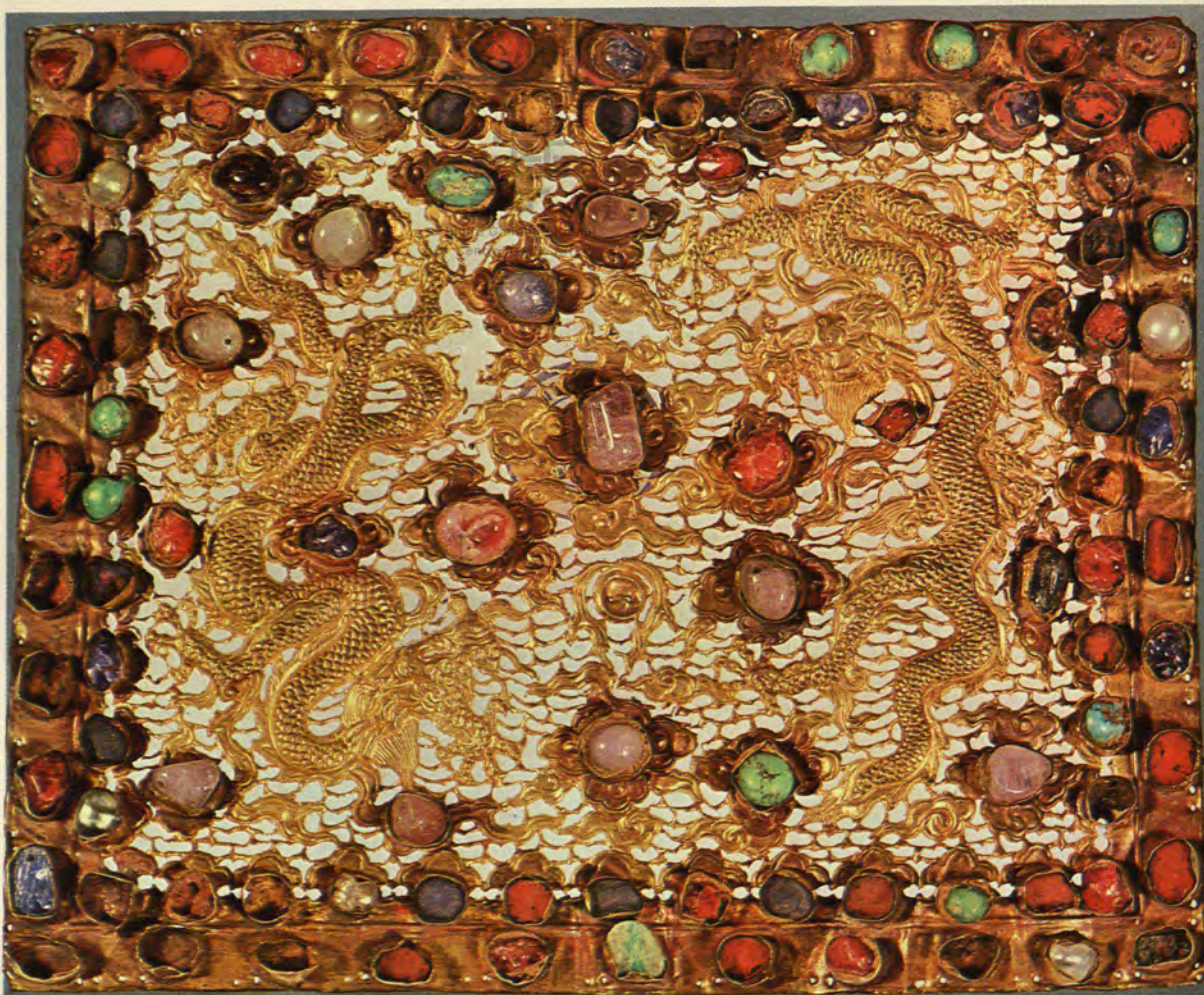
of kingfisher. The feathers would be mounted on a gold or silver support, resembling *cloisonné* enamel. This is an eighteenth-century technique which probably emulates more ancient examples. The feathers are an iridescent blue and the name of the bird came to be used to designate the most valuable jade, which in Europe is called gem jade or emerald jade.

Jade or jadeite (aluminum-sodium silicate), like nephrite (calcium-magnesium silicate) which, although it is a slightly different mineral, is always included with jade, is found in boulders or pebbles in alluvial deposits on hillsides and in water courses or in nests and veins through stratified rocks. The most important jade deposits are in the Mogaung region of Burma, while others are in Turkestan, China, Tibet, Mexico, Venezuela, Alaska and New Zealand. The most valuable nephrite is found in alluvial deposits in China. There are also some scattered deposits in Italy in the Ligurian Apennines, Basilicata, Calabria and Sicily. The pro-

Gold plaque with imperial dragons depicted in repoussé and precious and semiprecious stones, Chinese, early fifteenth century. right Gold earring with a phoenix, Ming dynasty, fifteenth to sixteenth century.

duction is not very important and is almost totally confined to China and Japan.

The Japanese civilization developed much later than the Chinese and followed much the same pattern. The few slight variations are of a local character usually concerning ornamental details peculiar to the elegant Japanese decorative repertoire. Here, too, most of the evidence is from sculpture, above all in the numerous colored wooden idols preserved in the temple of Nara and in various secular portraits of the Kamakura period (1185-1333) and later.







Gold ornaments of ancient America

Some regions of pre-Columbian America can be considered important centers of civilization and are, therefore, directly relevant to our subject.

With no apparent contact with cultures of other continents, the ancient people of the Andes (Peru, Colombia and Ecuador) and Central America (Mexico, Guatemala, El Salvador and parts of Honduras and Nicaragua) achieved their own major artistic evolution. The richest gold and mineral deposits in general were in Colombia and are still productive today.

Great quantities of jewelry and precious objects have been found at the bottom of sacred lakes and pools in Colombia. In a description of the rites of this country, chronicles describe an initiation ceremony for chiefs. The candidate, after a period of penitence which rendered him worthy to be elected, smeared his body with gold dust, went out on a raft to the middle of the sacred lake and dived into the water. In addition, many precious objects were thrown into the waters as offerings to the gods of the lake.

The area between the two parallel Cordillera ranges of the Andes, stretching from the south in the region of Lake Titicaca to as far north as the descent of the mountains into the valleys of Colombia and Ecuador, was the scene of an advanced civilization.

The conventional starting date of the classic period of Mesoamerican civilization is AD 300; its end came with the collapse of Maya civilization between 800 and 900. The people who formed the Andean culture are thought to have been part indigenous tribes, who, expanding from the western limits of the Amazon forests, crossed the mountain heights to the coast, and in part foreigners, who came from the north by land or sea. Although not in direct control with Mesoamerica, the Andean peoples were skilled in the use of gold, silver and copper, using these metals for tools as well as jewelry. The Inca culture prevailed in the fifteenth and sixteenth centuries and ended with the coming of the conquistadores.

An excellent example of pre-Columbian goldwork: a large breastplate in the form of the god of death, Mixtec-Pueblo, fourteenth to fifteenth century (Museo Regional de Oaxaca).



Tairona necklace with predators' claws and red stones. above left Moche gold earring in the shape of a bird. below left Mixtec ring with a bird's head. right Calima pectoral in hammered gold with a human face in high relief and suspended necklaces.

The most beautiful gold of the Andes region came from the centers of Chimú, Chanchan and Ika, and especially the first, during the Tiahuanaco and Inca periods.

For the Colombian and Ecuadorian regions it has not yet been possible to establish firm dates, but approximate chronology puts the San Agustín area as the oldest, followed by that of Chitcha. In the latter region, the most significant finds were the Quimbaya treasure and the products of the Upper Cauca.

The civilized regions of Mesoamerica which, theoretically, was the area limited by the Mexican state of Sinaloa to the north and by Honduras and Nicaragua to the south, manifested an artistic development which, together with that of the Andes, is the most important of the pre-Columbian era.

The techniques known in the Andes were so advanced that the possibility is suggested that in the pre-Christian era there may have been some link with the Asian continent. Apart from the gold beating and *repoussé* work, the peoples of the Andes, in particular the northern Chibcha, knew how to weld and understood the lost wax process, alloys and copper gilding. A

commonly used alloy was *tumbaga*, which consisted of copper and gold and was as current among the Andean cultures as among the Mesoamerican.

Pre-Columbian gold ornamental objects, particularly the earlier ones, probably had religious functions, as they were often linked with funeral rites.

Despite the indiscriminate plundering and total spoilation which accompanied the horrifying massacres of the Spanish conquest, six thousand seven hundred pieces of pre-Columbian goldware are conserved in the Museo del Oro, Bogotá. To these one can add a possibly even greater quantity scattered in museums, private collections and antique markets throughout the

world. The only collection in Peru, that of Miguel Mujica Gallo, contains above two thousand pieces.

About thirteen thousand pieces of gold were found sewn together on a poncho from Chimú. On certain occasions priests wore tunics made entirely of strips of gold foil sewn onto cloth. High priests, nobles and warriors wore a *nariguera*, a gold ornament which hooked onto the nostrils. *Orejeras*, traditional heavy earrings worn by men, were usually tubular hoops with openwork ornamental or zoomorphic decorations and a gem in the center. Two disc-shaped earrings from the Mujica Gallo collection are bordered with concentric patterns in pearls, while on the disc itself is a fully





modeled toucan. Another earring in the same collection consists of a fantastic bird suspended from a plain hoop. Splendidly decorated breastplates in various local styles were in wide use; in addition to anthropological and zoomorphic representations, they were decorated in *repoussé* with the various ornamental motifs often in high relief, which where a feature of Andean culture. A breastplate in the Nationalmuseet in Copenhagen is bordered with embossed stamps of a bird with spread wings and the head, which is very protruding, of a type of cuttlefish. In addition to ornamental motifs of a typically local character we find, perhaps by chance, patterns familiar in the west: the spiral, the Greek key and a version of the running dog. Small ornaments for use on clothing are often embellished with highly realistic reproductions of a large variety of marine fauna.

Among the most remarkable necklaces are those from Chimú (AD 1000–1200). An outstanding example, which was put up for auction at Christie's of London on 21 May 1968, consists of a circlet of granulated gold to which are attached eight similar figures of gods in ritual poses worked in *repoussé*; they are alternated with other smaller figures attached to the circlet by two granulated wires. Some other Quimbaya necklaces are made of *tumbaga* pieces in abstract forms of uncertain origin.

Precious stones used in Inca jewelry were rock crystal, emeralds, lapis lazuli, turquoise, pearls and coral. Peruvian skill in making alloys of gold is shown by the remarkable range of different colors, which vary from white to copper-red. Bronze alloy was known to the Andean civilizations later than that of precious metals.



In the Mesoamerican region, as well as importing gold, goldsmiths were brought in from outside. In the few examples we have, stylistic influence from the Andes can be detected during the Aztec period. The range of ornaments does not differ from that of the southern regions. The stylistic form shows strongly the high expressiveness characteristic of Aztec art which tended to be a disciplined plastic interpretation. Of the animals used in decorations, the serpent figures most frequently and in ornamental motifs the disc, sphere or spheroid and bell-shaped pendants often appear.

In the southern region of Mesoamerica the Maya were specialists in the use and carving of jade. The gold objects found in these areas were mostly imported from the southern regions or had been handed down from the ancient Toltec culture. Under Aztec domination things did not change: goldsmiths were still of Andean origin, and, though their formal themes underwent some variations, the basic style remained invariable.

The Spanish conquest put an end to the pre-Columbian artistic activities. In the centers where the richness of the deposits allowed, what remained of indigenous handicrafts was adapted for works which, with the introduction of Spanish elements, evolved into a hybrid style completely lacking any interest.

right Mixtec breastplate in gold in the form of the god of fire.
above left and right Brooches, pendants, a necklace, earrings
and a breastplate in gold from Chichén Itzá in Yucatán.





Goldsmiths and ornaments of Africa

Among the most highly developed tribes in Africa those which came into contact, even if only briefly, with more advanced cultures show a certain level of refinement in their personal ornamentation. In general new ideas were carried to various areas by the Arabs and then adapted to local tastes. The influence of higher cultures was mostly felt in the north of the continent, in Ethiopia, through Egyptian and Nubian contacts. These regions were visited by the Mediterranean peoples, in particular the Phoenicians, who carried new artistic ideas wherever they went, and, provided the right conditions prevailed, the seeds of these ideas took root and flourished. Besides the Phoenicians, Armenians, Arabs and Indians also contributed to the diffusion of jewelry styles and technical knowledge.

The prosperity of the areas where a tradition in metallurgy developed was generally based on the extraction and trading of gold, and the use of gold was reserved almost exclusively for the sovereigns and nobles. This was the case in the Sudan, in Ghana, Mali, and among the Yoruba peoples, who greatly influenced the Benin culture, the Ashanti and the Baulé of the Ivory Coast.

Nigerian sculptures from Ife, Benin and Esie show magnificent headdresses worn by women, which must have been made of gold. There are tiered towers, cupolas surmounted by cylindrical elements and smooth cones decorated with rich borders of embossed metal, with pendants which hang on the center of the forehead, or with pieces of *repoussé* metal or a net to contain piled-up hair and to which are attached a series of pendants encircling the head.

An ancient ivory mask from Benin has a mesh helmet surmounted by a halo-like arc of carved bearded heads. The collar which completed the mask must have been made of the same mesh which covered the head; it was

Benin bracelet, sixteenth century. It is made of ivory with carved Portuguese beads and is embellished with gilded brass ornaments of European origin (British Museum, London).



left Gold ring with a lion, and a half-moon-shaped ornament in repoussé. Both objects are of the Ashanti culture (British Museum, London). right Gold pendant with stylized rams' heads, Baulé culture.



expression of a superior culture, in fact the Benin culture, which from the twelfth century and for many centuries was isolated from European contacts, was the most progressive area in Africa in the field of artistic metallurgy. Evidence of this can be seen in the supply of the decorated bronzes produced at that time.

The same standards of quality in ornamentation apply to the Ashanti of Ghana, a territory rich in auriferous minerals. Every local chief had his little court and a workshop for gold and jewelry, but the most fabulous court between the eighteenth and nineteenth centuries was that of King Asantehene of Kumasi. Many examples have been found of the emblem of the "bearer of souls," a decorated disc which, together with other insignia, was worn by the king's pages. They were decorated with various *repoussé* concentric designs reminiscent of elements of Islamic, classical and Mediterranean art juxtaposed in a somewhat unorthodox manner. Hemispheres, stylized flowers, metal bosses of various shapes and sizes, woven patterns, done in *repoussé* or engraved with exceptional ability, enrich these discs. Others have pierced designs or are in the shape of stars. In none of these discs is the same design repeated and this diversity, which is characteristic of medieval Arabian jewelry, also applies to rigid necklaces, armlets and other decorated ornaments. Hairpins are elaborately embellished with high-relief plant or animal forms cast in the lost wax process.

The popular works of these and other regions were mostly made from a low alloy of silver, and were gaudily decorated with a profusion of pendants, filigree, semiprecious stones and coins, but these belong to folkloristic art.

When discussing the artistic expression of these peoples, one usually feels a sense of superiority or, alternatively, one of inferiority. Fortunately, from a critical and aesthetic point of view, there still remains a primitive influence, like a genuine, inherent expression of the human spirit, which more advanced civilizations could never imitate. Technically and instrumentally one notices somewhat smugly the inevitable simplicity and direct relationship that exists between these people and their art. Yet in jewelry all complexes and barriers are removed between the art of more advanced civilizations and that of the so-called primitive and aboriginal races.

slung under the chin from ear to ear by a broad band containing a plait of really impeccable workmanship.

A bronze bust of an Ife king shows in great detail the richness of the precious ornaments worn by the sovereigns. In the middle of the forehead, suspended from the helmet is a sumptuous jewel on a lobed support consisting of a large stylized flower, with a protruding gem in the middle; under this is an ornamental boss in high relief, which seems to have a stone at its summit. The neck and chest are covered with heavy necklaces of carved beads from which hang other pieces; in addition, an even longer necklace hangs over the bust. The quality of these ornaments rises above folk art to become the



Gems used in Jewelry

NAME VARIETY	HARD- NESS	COLORING	DEPOSITS	PERIOD OF GREATEST USE
Amber or Succinite (fossilized resin)	2½-3 (and 1½)	transparent, semiopaque, translucent, variegated and mottled; from clearest to darkest yellow, tending to red and brown; also blue, violet and green	Baltic coast, Friesian Islands, Rumania (rumenite), Burma (birmite), Galicia, France Spain, Russia, Canada, San Domingo	from prehistoric to modern times
Andalusite	7½	whitish, gray, green, olive, red, red-brown, violet; slightly transparent	Andalusia, Austria, Saxony, Brazil, Urals, Sri Lanka, Massachusetts	19th and 20th centuries
Beryl emerald	7½-8	light green to deep green; transparent	Colombia, Upper Egypt, Urals, Siberia, Brazil, Salzburg Alps, North America, Transvaal, India, California, Madagascar, Elba	Egyptian, Greek and Roman eras; from the 17th century onwards
morganite	7½-8	pink, pink lilac		19th century
aquamarine	7½-7¾	pale blue, transparent	Brazil, Urals, Madagascar, Elba	from the 17th century onwards
Corundum ruby ruby star	9	transparent, various shades of red	Sri Lanka, Burma, Thailand, Kashmir, Australia, USA (Montana and North Carolina), Madagascar, Urals, Saxony, Bohemia, France	mentioned by Pliny, Marco Polo, Albertus Magnus; rarely used until the 16th century, more frequent from the 17th century
sapphire sapphire, star	9	blue, pale blue, with star effect		from the 18th century onwards
aquamarine oriental		pale blue		19th and 20th centuries
amethyst oriental		various shades of violet, often tending to red		19th and 20th centuries
topaz oriental		yellow, clear lemon		19th and 20th centuries
Chrysoberyl chrysoberyl	8½	pale yellow, pale green; from transparent to opaque	Brazil, Sri Lanka, USA, Madagascar	known in the classical era; 19th century
golden chrysoberyl or chrysolite		old gold, yellow-gold, tending to greenish	usually Brazil and as above	known in the classical era; 19th century
oriental cat's eye		green or yellow mixed, showing streaks of reddish, bluish or violet light	Sri Lanka, Brazil	known in the classical era; 19th century
alexandrite		emerald, dark and olive green	Russia, Sri Lanka, Tasmania, Rhodesia	19th century

NAME VARIETY	HARD- NESS	COLORING	DEPOSITS	PERIOD OF GREATEST USE
Diamond	10	transparent, colorless, blue-white, shades of yellow, green, pink, red, blue, gray, black	India, Brazil Guyana, North and Southwest Africa, Congo, Angola, Tanzania, Rhodesia, Cameroun, Ghana, Sierra Leone, North America, Australia, Borneo, Russia	mentioned by Pliny and Marco Polo; from the 17th century onwards
bort carbonado		translucent; gray, opaque, black		
Feldspar				
orthoclase	6	gold-yellow, lemon-yellow	Madagascar	20th century
adularia or moonstone		transparent, colorless, green, pearly, milky, bluish-white	Sri Lanka, Brazil, USA, Australia	19th and 20th centuries
oligoclase or sunstone		almost opaque, grayish-white background, flecked with gold particles	Norway, Russia, USA	19th and 20th centuries
labradorite		opaque, gray background, flecks of all colors	Labrador, Russia, Finland, USA, Sweden	19th and 20th centuries
Jet (black lignite)	3-4	opaque, brown, black	Whitby and Cleveland (UK), Spain, France, Saxony, Russia, Colorado	19th century
Jade or Jadeite	6½-7	opaque or translucent; not uniform; basically white or grayish tending to pink or lilac-blue; specks of emerald green or light green	Burma, Turkestan, China, Tibet, Mexico, Costa Rica, New Zealand, Alaska, Greece, western Alps	pre-Columbian era, the Far East in prehistoric times; in Europe 19th century onwards
Garnet (carbuncle) hessonite	7	reddish-orange, cinnamon yellow	Sri Lanka, USA, western Alps, Madagascar, Tyrol, Urals	from the 17th century onwards
pyrope or Bohemian ruby or Cape ruby	7½	fiery red	Bohemia, Saxony, Switzerland, South Africa, Sri Lanka, Scotland, western USA, Brazil	infrequently used in the Middle Ages and Renaissance; much used in 19th century
almandine or precious garnet	7½-7½	violet-red	India, Brazil, Uruguay, South Australia, USA, Madagascar, Greenland, Bohemia, Spain, Austria, Russia, Norway, Switzerland, Hungary, the Alps	mentioned by Pliny; used in the classical era for engraving; from the 19th century onwards
demantoid	6½-6¾	green, yellowish-green	Urals, Val d'Aosta, Val Malenco (Italy)	19th century
Malachite	3½-4	composed of copper; translucent or opaque; emerald or dark green; mottled with dark or light bands	Urals, Rhodesia, Katanga, Chile, USA, Australia, Rumania, France	19th century

NAME VARIETY	HARD- NESS	COLORING	DEPOSITS	PERIOD OF GREATEST USE
Marcasite	6-6½	opaque, gold-yellow, metallic	Folkestone (UK), Bohemia, Czechoslovakia, Saxony, France, Mexico, USA	19th and 20th centuries
Nephrite or Jade	5½-6½	opaque or translucent; gray-white, gray-green, grass green, yellowish, brown, reddish	Turkestan, China, Russia, New Zealand, New Caledonia, Venezuela, Brazil, Peru, Alaska, Switzerland	pre-Columbian era, the Far East in prehistoric times; in Europe 19th century onwards
Opal precious opal	5½-6½	semitransparent, milky white tending to blue with shimmering rainbow-like colorations. Rarely: yellow, red, green, blue and black	Czechoslovakia, Mexico, Australia, Honduras, Guatemala, USA, Japan	used occasionally in the Roman era; 19th century
fire opal		transparent to opaque, hyacinth-red, reddish-yellow, orange, wine-red, brownish-yellow. Rarely: iridescent, red or green streaks	Mexico, Faroe Islands, Nevada, Australia	19th century
Quartz rock crystal	7	very transparent, colorless	mainly: Alps and other parts of Italy, Tyrol, Silesia, Scotland, Urals, Brazil, Madagascar, Japan	classical, Byzantine, barbarian, high medieval and Renaissance eras; 17th, 18th 19th centuries; less popular in modern times
amethyst		transparent; all shades of violet	Brazil, Uruguay, Sri Lanka, South Africa, Mexico, Madagascar, Russia, Australia, North America, Spain, France, Hungary, Italy	classical and Renaissance eras, and 19th century
rose quartz		milky rose-pink; semitransparent	Brazil, Southwest Africa, Japan, Madagascar, Sri Lanka, USA, Bohemia, Bavaria, Scotland, Ireland, Italy, Russia	classical and Renaissance eras, and 19th century
sunflower quartz		semiopaque, bluish-white, milky opalescent	Brazil, India, Bohemia, Hungary, Siberia	classical and Renaissance eras, and 19th century
falcon's eye		opaque; grayish blue with shimmering streaks of greenish-blue light	South Africa	classical and Renaissance eras, and 19th century
aventurine		opaque; red-brown, and green	Russia, India, Tibet, Egypt, Australia, Brazil, Bavaria, Syria, Scotland, Spain, France, Italy	19th century
jasper		white, red, green, blue, yellow, brown, black, opaque, variegated	Saxony, Siberia, Egypt, USA, Brazil, South Africa, Madagascar, Italy (Tuscany)	Egyptian, classical, high medieval and Renaissance eras; 19th century

NAME VARIETY	HARD- NESS	COLORING	DEPOSITS	PERIOD OF GREATEST USE
chalcedony	6½-7	milky, whitish, bluish-gray, greenish, yellowish	Faroe Islands, Iceland, Brazil, Uruguay, Italy,	classical and Renaissance eras, and 19th century
blue chalcedony		light blue, blue, opaque	Arizona, Oregon, Siberia, India, Rumania	19th century
cornelian		blood red, various shades to yellowish-brown	India, Brazil, Arabia, Russia, Japan, Germany	classical and Renaissance eras, and 19th century
sard		brown, black-brown, orange-brown, semitransparent	India, Brazil, Arabia, Russia, Japan, Germany	classical and Renaissance eras, and 19th century
chrysoprase	6¾-7	apple-green with white and gray streaks	Silesia, India, Urals, Australia, USA, Canada	classical era and 19th century
plasma		dark green, olive, opaque	East Indies, Upper Egypt, Germany	Egyptian and classical eras
agate		stratified, green, light-blue, white, red, brown, black; semitransparent	Germany, Brazil, India, Asia Minor, China, Madagascar	classical and Renaissance eras, and 19th century
onyx (variety of agate)		striated; white, black or black and red lines or curves	Germany, Brazil, India, Asia Minor, China, Madagascar	classical and Renaissance eras, 19th century
Sodalite lapis lazuli or lazurite	5-5½	opaque; sea-blue, dark or light-blue, tending to green or violet; specks of gold due to inclusion of pyrites	Afghanistan, Russia, Chilean Andes	Mesopotamia, Egypt, classical era, Renaissance, 17th, 19th and 20th centuries
Topaz	8	translucent, yellow-gold, honey-yellow. Rarely: blue-green, pink, red	in antiquity: Upper Egypt, Saxony; today: Brazil, Urals, Siberia, California, Utah, Australia, Mexico, Japan, Madagascar, Sri Lanka	from the 18th century onwards
Turquoise	5-6	opaque; apple-green, green, light sky blue	Iran, Turkestan, Tibet, Sinai, Arabia, New Mexico, California, Australia, South Africa, Silesia, Saxony	Egypt (from the 3rd millennium BC), pre-Columbian, Renaissance, 19th and 20th centuries
Zircon precious zircon	7½	transparent to translucent; shades of green, yellow, gray, violet	widely found: Norway, Sweden, Canada, Madagascar, Sri Lanka, Thailand, Australia	from the 18th century onwards
jacinth		orange-red, red, dark-red, light-red, violet-red	Sri Lanka, Indochina, Brazil, Thailand, South Africa,	19th and 20th centuries
starlight		blue, bluish-green, electric-blue	Thailand	19th and 20th centuries
colorless zircon or Matara diamond		transparent, colorless	as other varieties	19th and 20th centuries

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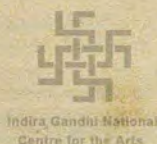
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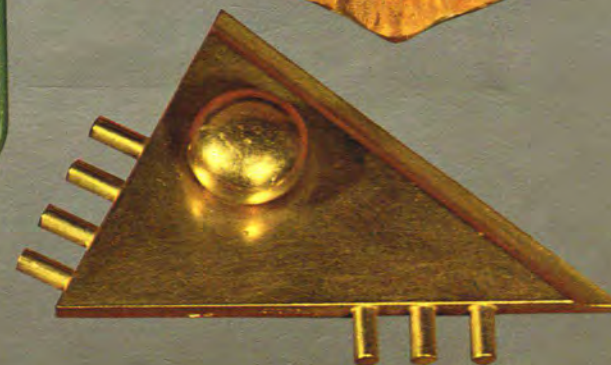
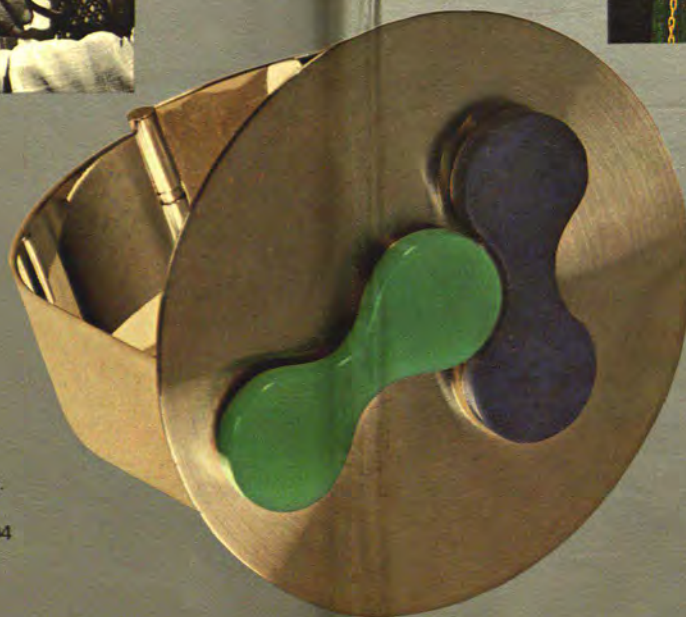


Guido Gregoriotti was born in Palermo in

Guido Gregoriotti was born in Palermo in 1907. He received a solid technical-artistic grounding, first through his father, who was a painter and a teacher of decorative arts at the Academy of Fine Arts, then through his studies at school and later at the Academies of Palermo and Rome. He decided to devote himself to painting. He took the chair of design at the Liceo Artistico at Palermo, later moving to Milan, where he set up home permanently in 1945.

His interests in the field of art history and particularly in the decorative arts made him neglect his own painting. In 1951, after being appointed manager of the reconstruction of the Poldi Pezzoli Museum, half destroyed by bombing in 1943, he was made director of the museum. He held this post for 22 years, greatly increasing its lively and modern cultural activities.

He is the author of the "Jewelry" entry in the Encyclopedia Britannica, and was called upon to take part in judging the 1977 Diamond Award in New York.



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